Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOL. XIV. NEW YORK, FEBRUARY 19, 1859. NO. 24.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY
At No. 37 Park-row (Park Building), New York,
BY MUNN & CO.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns of the United States.

Single copies of the paper are on sale at the office of publication, and at all the periodical stores in this city Brooklyn and Jersey City.

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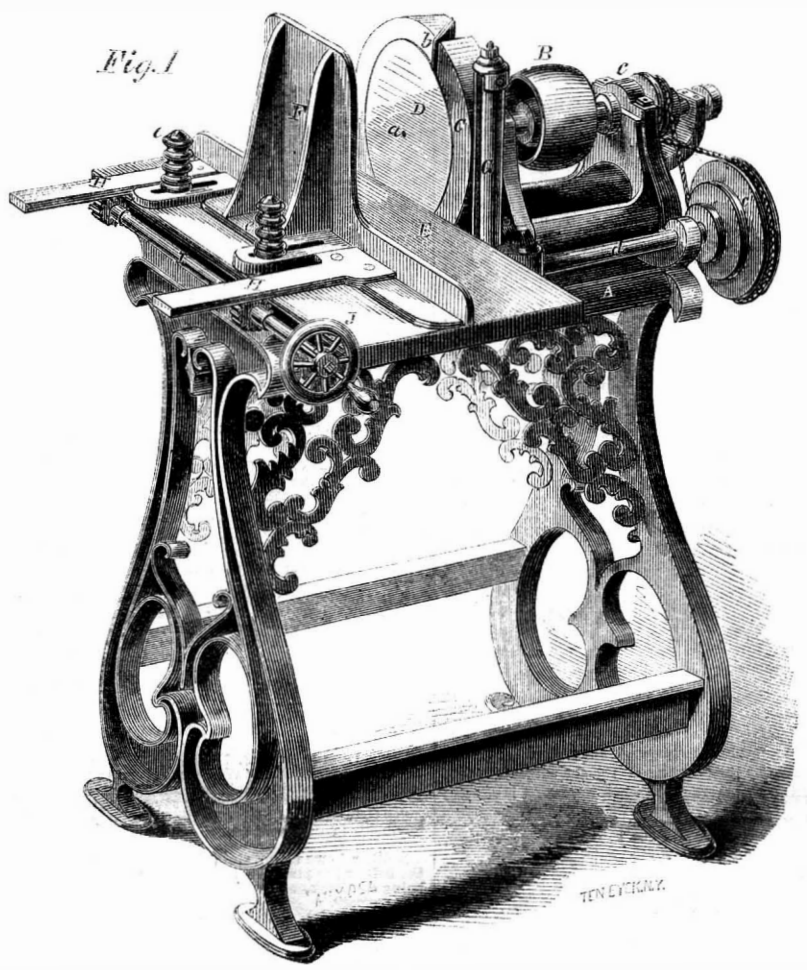
Circulation of Water in Boilers.

A correspondent of the London *Engineer*—John Player, C. E.—gives some excellent advice regarding the construction of boilers and the prevention of priming. He states he was convinced that the danger of explosions would be greatly diminished, and a greater evaporation of steam effected with the same quantity of fuel, were he able to maintain a constant circulation of the water in the boiler. Twenty years ago he commenced to make experiments for effecting this object. In one of his first experiments with a small boiler he could not keep the water in it, on account of priming, so that the fire-box soon became very leaky. He removed this evil by placing a perpendicular funnel-shaped tube in the water, its top being set about one inch below the water surface, while its lower end reached nearly to the bottom of the boiler. In the boiler thus arranged, when the fire was raised, the surface of the water streamed towards the funnel, and descended to the bottom; the heated water then ascended, threw off its steam, and again descended through the tube. He urged the fire with a powerful three-foot fan blast, but was not able to make the boiler prime or raise its water level. Of later years he has used this plan in large steam boilers, and with good effect. He says:—"I feel satisfied that if tubes were placed in the side water spaces of locomotive boilers, they would cause an uninterrupted descending current, and the real level of the water would be more correctly indicated by the trial cocks."

How Coffee came to be Used.

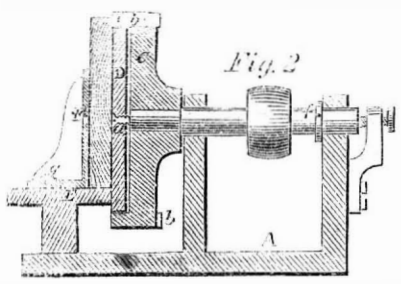
At the time Columbus discovered America, coffee had never been known or used. It only grew in Arabia and Upper Ethiopia. The discovery of its use as a drink is ascribed to the superior of a monastery in Arabia, who, desirous of preventing the monks from sleeping at their nocturnal services, made them drink the infusion of coffee, upon the report of some shepherds, who observed that their flocks were more lively after browsing on the fruit of that plant. Its reputation rapidly spread through the adjacent countries, and in about two hundred years it reached Paris. A single plant, brought there in 1614, became the parent stock of all the coffee plantations in the West Indies. The extent of consumption can now hardly be realized. The United States alone annually consume at the cost of its landing from fourteen to fifteen millions of dollars. You may know the Arabia or Mocha, the best coffee, by its small bean and dark color. The Java and East India, the next in quality, is a larger bean and of a pale yellow color. The West India Rio has a blue, greenish grey tint.

COTTRELL'S PLANING MACHINE.



The portability, simplicity and trueness with which these machines work, is bringing them into very general use, in small machine and carpenters' shops especially, and they fully answer the expectations formed of them. The inventor is C. B. Cottrell, of Westerly, R. I., and he has assigned the invention to Cottrell & Babcock, of the same place. The following description and accompanying drawings will fully explain the invention:—

Fig. 1 is a perspective view, and Fig. 2 a section through the working parts.



A is the bed-plate on which the whole rests, B is a pulley that receives power from any convenient motor, and causes the cutter ring, C, which carries the cutters, *b*, to revolve. On the bed-plate, A, there is also a plate, E, carrying an adjustable disk, D, that fits into the cutter ring, and so forming an adjustable gage. It is connected with the spindle of C and B by a small screw, *a*, and this by being tightened or slackened alters the depth of the cut, or, in other words, gages the cutters. F is a slide rest, which can be worked up to keep stuff of any thickness close to the cutters, by a rack on the projecting arms, H, and two pinions on the shaft, I, that is turned by the hand-wheel, J; and F can be secured in this position by the screws, *e*. A collar, *f*, keeps the spindle in its bearings. The feed motion is obtained by a cone pulley, *c*, being placed on the spindle, and a belt from it rotates another cone pulley *c'*. on a shaft, *d*, which rotates, by a bevel gear, a horizontal serrated feed roller in a case, G. This always keeps the stuff moving, while the slide keeps it to the cutters. We have seen some excellent specimens of planing done by this machine, which is one of the best and simplest that that has come under our notice, and a dressing slide (not shown in the illustration) is furnished with each, so that stuff can be planed out of wind, or on any angle desired, and with a beautiful surface.

It was patented Oct. 5, 1858, and one may be seen at J. B. Schenck's, No. 62 Cortlandt street, this city. The assignees may be addressed for further information as above.

The Odoriferous Products of Flowers.

We love to see the flowers growing, and to inhale their fragrance floating on the evening breeze; and often, when we have for hours enjoyed the soothing influence that their varied colors and richly delicate odors have upon the senses, we have felt a deep regret that we could not preserve the perfume, and have it near us to refresh our weariness or to stimulate our brains, through the medium of the olfactory nerves. We are unable to do this privately; but our good friend and esteemed correspondent, Septimus Piesse—whose pleasant writing has often enlivened our columns—with the gardens at Nice, in Sardinia, and extensive plots in England, (which the firm of Piesse & Lubin, of 2 New Bond st., London, own,) can supply them to the whole world. In those gardens they grow the tuberose, jasimin, acacia, violet, orange bergamot, lemon violet, rose, lavender, peppermint, and all the rarer varieties of plants, whose odors are extracted at the "Laboratory of Flowers." The scents of their production are perfect, and would well pass for the real flowers. The manufactures are gradually becoming better known, and more highly appreciated in this country—the agent being J. Phillips, of 87 Pearl st., this city. We hope that those who use scent will prefer the extract of the pure and simple flower to the mixtures which modern want of taste has caused to be so largely manufactured.

Primitive Modes of Working Iron.

The early productions of the Malagasy smiths were necessarily rude, but since the instructions given to a large number of youths by the thoroughly qualified English smith sent out with the missionaries, their work has been improved, and is creditable to their intelligence and skill, especially when the simple apparatus by which it is produced is considered. The smiths who work for the government sometimes form almost entire villages, and work together in sheds; but the native smith, who on his own account plies his craft, works at the south end of his dwelling. His forge is a simple affair; the earthern floor of his house forms the hearth for his fire, which is kept together by three or four stones. The bellows consist of two wooden cylinders with pistons, similar to those which supply the draft for the smelting furnace. The anvil, which is about 6 inches square, 6 inches high, is let into a thick piece of wood fixed in the ground, with the water-trough, tongs, hammers, and other tools near it. The smith squats on a piece of plank or board on the floor, and his assistants sit or stand opposite him with sledge-hammers in their hands to strike when required; and by this simple process the articles of iron in general use among all classes of the people are produced. —*Ellis's Three Visits to Madagascar*.

Stopping Locomotives.

A cotemporary describes the following method of stopping locomotives by an invention which he ascribes to a Frenchman. He says:—

"In effecting this object, the steam is converted from a propelling to a resisting medium, and presents an elastic obstruction to the advancing piston in the steam cylinder. Over the steam ports of the cylinder a slide valve is applied, composed of iron and steel plates attached together, the steel face being to receive the ordinary cut-off and supply valve, and the iron face lying close to the planed face of the steam ports. This intermediate valve is so arranged that when the break is required to be put into action, it shall slide on its seat, and intercept the passage of the steam to the exhausted side of the piston, and permit the steam to be supplied to the opposite side. A cushion of steam will thus be opposed to the advancing piston, and if displaced by the impetus of the engine acting on the piston, a similar obstruction will then be offered to the other side of the piston as it advances, and so on until the action of the engine is suspended."

This invention may be called a steam-buffer brake, but we do not like it, because it throws the braking strain on the piston rod, connecting rods, and crank pin, in resisting the momentum of the engine. This is an objection which we have to urge against it; on the other hand it appears to be a very simple brake arrangement.

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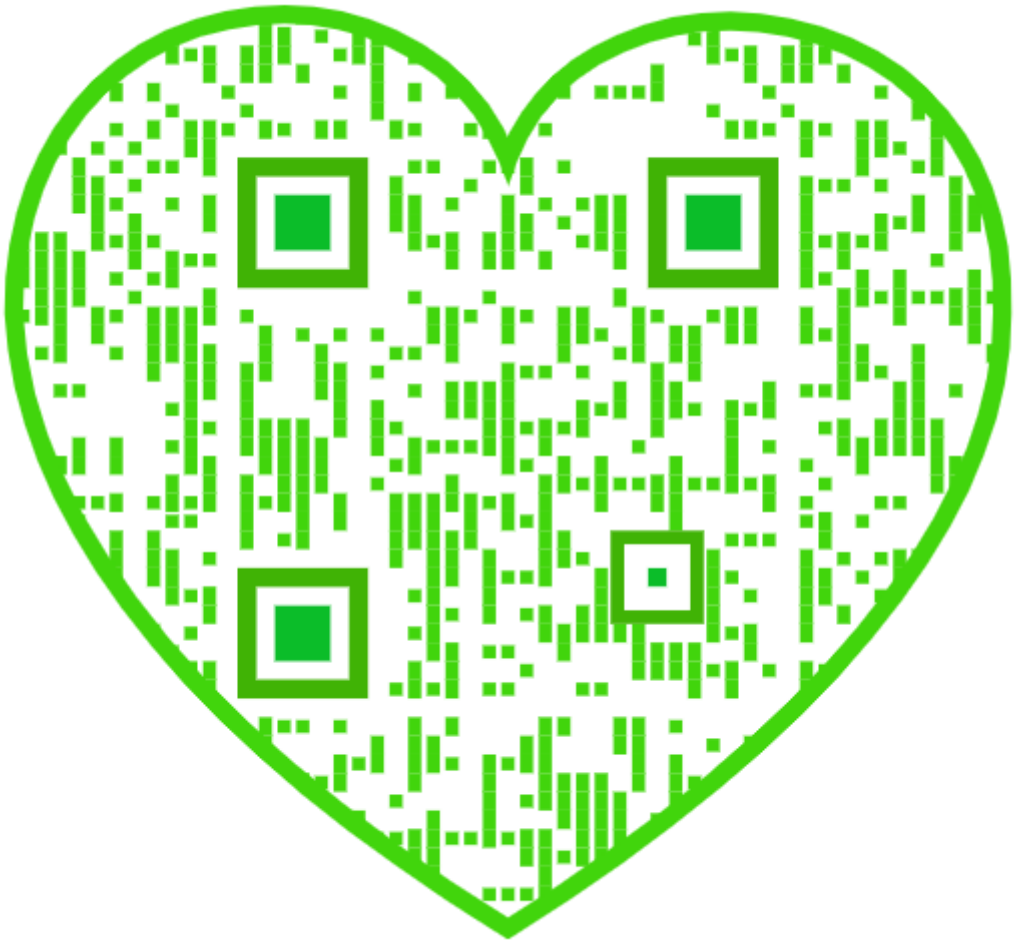

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY 8, 1859.

Reported officially for the Scientific American.]

*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

MACHINE FOR MAKING RIVETS, BULLETS, &c.—C. B. Allen, of Philadelphia, Pa.: I claim the revolving shaft, C C C, with their inclined planes, e e' e e' e e', and former, as described, and the mold wheels or formers, D D D, attached thereto, in combination with the yoke, F, and wheel, G, whereby the extremities of the shafts to which the mold wheels or formers are attached, are made to approximate and separate.

I also claim the bar, N, and the inclined plane, n, in combination with the rod, f, and cutter wheel, g, constructed and operated substantially as described, whereby the portion of metal which has been molded or formed may, when so desired, be severed or detached.

RAILROAD SAFETY SWITCH—Giles S. Appleton, of Burlington, Vt.: I claim, first, The combination of the broad and even switch rails, E E', with the broad and even traverse rails, F F', long guide rails, H H', and short lift and guide rails, a b c and a' b' c', when the same are arranged in relation to each other substantially as shown and described.

Second, Allowing the wheels to play upon the wide traverse and switch rails after leaving the short lift ways and guide rails, before they reach the main track, substantially in the manner and for the purposes as described.

METHOD OF OPENING AND CLOSING GATES—J. A. Ayers, of Hartford, Conn.: I claim the counterpoised or loaded platform, E, formed of two parts, d d, connected by joints or hinges g, and placed in the carriage way, A, beneath the gate, and extending a requisite distance at either side of it, when said platform is connected by suitable mechanism with the gate substantially as described, to operate said gate, as and for the purpose set forth.

I further claim in connection with the platform, E, the locking device formed of the drop bars, L L, the jointed levers, M M, connected with the bars, N N, which are provided with the upright arms, r r, extending upward through the platform, the whole being arranged to operate conjointly, as and for the purpose set forth.

[This is an improvement in that class of automatic gates in which a movable or vibrating platform is employed and actuated in the first instance by the gravity of the vehicle or team approaching the gate—the platform being connected with the gate by mechanism so as to open and close it as the platform rises or falls. The object of this invention is to prevent the opening of the gate by animals passing over the platform, (an objection which has made these gates almost useless); and further, without any extraneous fastening, preventing the gate, after being opened, from closing until the vehicle or team has passed entirely through it.]

SAWING MACHINE—Benjamin Barker, of Ellsworth, Maine: I claim first, the sawdust spout, H, arranged relatively with the edging saw, D, and feed table, C, substantially as and for the purpose set forth.

Second, The trimming saw, K, when used in connection and arranged relatively with the edging saw, D, to operate conjointly therewith, as described.

[The object of this invention is to enable the circular saw to cut lumber while moving in either direction; so that the time hitherto expended in "gigging back" will be usefully employed. The invention also has for its object the trimming of the ends of the lumber, so that the edging or slitting and trimming may be performed at one operation. These ends are attained by the employment of a sawdust spout, arranged relatively with the saw in such a manner as to receive the dust therefrom, and carry it to the back side of the feed table, also by the use of a trimming saw, arranged to cut the ends of the lumber.]

EARTH EXCAVATORS—Joseph P. Barker, of Wayne, Ohio: I claim the manner of arranging and adjusting the apron, and operating the same by means of the bent levers, J, for the purpose of conveniently discharging the earth taken up at any desired point, as set forth, and used in connection with the adjustable wheels, as described.

STEAM PLOWS—Samuel K. Bassett, of Galesburgh, Ill.: I claim having the wheels, B, of the truck, A, attached to separate axles, C, with pivoted or swiveled inner bearings, b, the outer bearings of the axles being fitted in guides, D, and the outer ends of the axles being connected by rods, E, with racks, F, into which pinions, c, of shaft, G, gear, the shafts being connected by the endless chains, J, passing around cone pulleys, I, placed in reverse positions on the shafts, the whole being arranged to operate substantially as shown and described, to facilitate the guiding and turning of the machine, as set forth.

[For more information about this invention see another page.]

BILLIARD REGISTER—Henry J. Behrens, of New York City: I claim the use of numbers instead of balls—technically called "points"—so arranged and worked by mechanism that any number of points made by the player may be readily marked on the number itself, and the amount of the thus successively marked points is made to be shown by the register, the whole arranged and operated by mechanism substantially the same as described.

MONUMENTAL DAGUERREOTYPE CASES—Jacob Bergstresser, of Berrigsburgh, Pa: I claim the combination of the central frame encased by a central raised bead, b, on the rear side of a glass plate, with the outer frame encased by an outer raised bead, a, the central frame and outer frame being cast together on the same glass plate, and the outer one being deeper than the inner or central frame, substantially as and for the purposes set forth.

COFFEE POTS—E. H. Covell, of New York City: I claim, first, The combination of the chamber, C, with the condensing chamber, D, and condensing pipes, E E', as and for the purpose set forth.

Second, The combination of the condensing pipes, E E', with the steam pipe, F, and trap, G, as described, and for the purposes set forth.

APPLICATION OF ELECTRICITY IN DENTAL OPERATIONS—Wm. G. A. Bonwill, of Dover, Del.: I do not claim the application of electricity to dental purposes, as this is shown in the patent of J. B. Francis.

But I claim in the application of electricity to dental purposes, the mode described of extracting or extirpating the dental pulp or internal nerve of teeth, to wit, by the application of a current of electricity through the instruments made use of in the performance of said operation, directly and constantly to the dental pulp, or internal nerve, during the operation of cutting out or extracting the same, as set forth, and for the purposes described.

PHOTOGRAPHY ON WOOD—Charles B. Boyle, of Albany, N. Y. Patented in England January 7, 1859: I claim first, The described or substantially equivalent method of applying albuminous matter, and afterwards coagulating it by heat, so as to form an insoluble base within the pores of the wood, for the purpose set forth.

Second, Taking photographic pictures upon wood, the pores of which have been filled with gelatine, or its equivalent, and subsequently removing the gelatine from the block without injury to the picture by the application of a warm solvent.

MACHINE FOR RIVING LATHS FROM THE BLOCK—J. L. Brown, of Indianapolis, Ind.: I claim the combination and arrangement of the yoke, D, knife plate, C, guides, F and G, with the pitmans, N and M, elbow levers, K and L, rests, I and I, when constructed and operated substantially as and for the purposes set forth.

MANUFACTURE OF RUBBER HOSE PIPES—John H. Cheever, of Boston, Mass.: I do not claim the vulcanizing process, or any compounds of rubber referred to, because, with the exception of the cross fiber compound, they are old; nor heating the hose or pipes on rods or tubes of iron; nor any peculiarity in the construction of the machine.

Neither do I intend, in this application, to claim forming a cross-fibered fabric, as these will constitute the subject of other patents.

But I claim the new article of manufacture, consisting of hose or pipe made of fibrous rubber by powerful pressure, and without seams or joints, substantially as described.

HARVESTERS—George E. Chenoweth, of Baltimore, Md.: I do not claim making the shells of the cam cylinder adjustable, to compensate for wear, as that has been secured to me in a former patent.

But I claim the combination of the cam cylinder with the cross arm, slide bar, and slotted or jaw lever, constructed, arranged, and operating substantially in the manner and applied to the purpose specified.

I also claim a slide bar having two cross arms provided with friction rollers, and working in the slotted box, L, as described.

VALVE BUNG—Florian Dahis, of Williamsburgh, N. Y.: I do not claim, broadly, a bung provided with a valve, irrespective of the construction and arrangement of the same, for such device has been previously used.

But I claim a bung, A, provided with an air passage, a, terminating in a recess or chamber, b, in which a disk valve, c, of rubber, or other suitable material, is placed, and secured therein by a plate, e, provided with a hole, f, specifically as and for the purpose set forth.

[This invention consists in having a valve fitted in a wooden bung, and arranged in a peculiar way, whereby a very simple, cheap, and efficient self-acting valve bung is obtained, the valve readily yielding to atmospheric pressure, and opening when the faucet is opened, so that the beer may escape from the faucet, and closing by the pressure of the gas within the keg, and excluding external air when the faucet is closed.]

WASHING MACHINE—Beriah Douglas, of Appleton, Wis.: My claim is not for the tub or rocker described, which are novel only in part.

But I claim the washing seat and the foot box as combined with the washing rocker and the hand supporters, and the clothes holder or wringer as combined with the washing tub, all for the purposes assigned to them.

CULTIVATORS—James Dundas, of Little Rock, Ill.: I claim the arrangement of the half shovels, w w, in connection with the bar, h h and i, to be moved to the right or left at pleasure of the operator.

CULTIVATORS—George Essington, of Plainfield, Ill.: I claim the arrangement of the mold-boards, T T, center-piece, P, in combination with the coulter or standard, H, point, I, and shares, J J, the whole being constructed substantially as described for the purpose set forth.

FURNACE FOR SMELTING IRON—Squire M. Fales, of Baltimore, Md.: I claim the combination with the ordinary furnace of the arched chambers or recesses at the sides of the furnace, as described, the opening in the crown of the arched recess or chamber, as set forth, and the movable tymp at the external openings of the arched chambers or recesses, as specified.

CATTLE PUMPS—Daniel P. Farnham, of Johnstown Center, Wis.: I do not claim raising water by the weight of an animal upon a platform.

But I claim first, The combination of the lever and rod, or their equivalents, with the gate and inclined platform, arranged and operating substantially as described for the purpose set forth.

Second, The strips of metal, e, secured on the inside of the barrel of the pump, to prevent the valves from coming in contact with the plunger as it works up and down, in combination with the barrel, as set forth.

Third, The packing ring, I, constructed as described, and kept up to the plunger by weights on the back side as set forth.

MORTISING CHISEL—J. B. Fisher, of Beaver Dam, Wis.: I claim constructing the tool with two cutting edges or portions, a' b, of different lengths, substantially as shown and described, for the purpose set forth.

[The tool is formed with two cutting edges, the cutting portion at one end being considerably shorter than the other; and they are so arranged that mortises may be cut without the necessity of reversing the tool, and the chips effectually discharged from the mortises by the action of the tool.]

MANUFACTURE OF CAST STEEL—Perry G. Gardiner, of New York City: What I claim is not simply the gradual and prolonged cooling of the metal after melting, as aforesaid.

But I claim the process as a whole of pouring the melted metal into intensely heated molds, and then placing them, thus filled, immediately into the heated oven or furnace where they congeal, away from the external atmosphere, down to a cherry red heat, and then immediately plunging the ingots or bars into the highly heated oil, and retaining them immersed in it for a considerable time, as described.

MANUFACTURING TOOLS FROM CAST STEEL—Perry G. Gardiner, of New York City: I claim the process of treatment of the cast steel, by pouring it, in a molten state, into molds of the shape and size required for tools, instruments, axes, &c., previously heated to a high degree of heat, the steel being melted in a closed oven or furnace, and then replacing the molds so filled in an oven or furnace, away from the external air, and keeping them there until they have been cooled down to a cherry red heat, and then immersing the tools, axes, &c., into the fluid mixture, of a temperature of from 100° to 150° Fah., as described.

GUN LOCK—J. A. Lowe, of New York City: I claim the rule joint, or its equivalent, in the link, substantially as described and for the purpose set forth.

MAIL BAG FASTENING—John C. Garland, of Chicago, Ill.: I claim the employment of a slotted sliding strap, F, when made of a single steel spring, and used in combination with a series of narrow stationary iron guides, E, attached to the perforated flap of the bag, and with a steel spring, R, having headed stop pins, C, fitted between the front portion of the binding and the upper edge of the mail bag, substantially as and for the purposes set forth.

[This is designed to facilitate the opening and closing of mail bags by the officers at the Post-office, and at the same time render the same perfectly safe against mail robbers. The invention consists in a sliding steel strap, having oblong slots working in connection with stationary pins. By simply sliding the strap so that round portions of the slots come in line with the pins, then closing down the flap of the bag, sliding the strap until the pins overlap the straight portions of the slots, and locking the hasp on a staple, the bag will be securely locked; and by reversing these operations, the bag can as quickly be opened. The invention has, to our knowledge, been submitted to the heads of the Post-office Department, and is highly approved of on account of its cheapness, the facility with which it can be opened and closed, and the great security against mail robbers.]

ROTARY SPADING MACHINES—George W. B. Gedney, of New York City: I claim a series of spades which are operated substantially as set forth, so as to descend edgewise into the soil, successively in each others track, and then to move laterally to detach the slice of soil upon which they operate from the undisturbed land.

I also claim combining an endless series of spades, operating substantially as set forth, with a cam, or its equivalent, that controls their positions by means of spade handles or their equivalents, that are connected with the blades of the spades.

I also claim adapting the machine to be moved either end forward, by constructing the device that imparts lateral movement to the spades in such manner that its position may be changed, and that it may be made fast in either position.

SKIRT HOOPS—James C. Gilbert, of Winthrop, Md.: I claim in connection with the movable spools and springs placed or strung on the cord, a series of stationary abutment blocks, a a a, fastened at intervals to the cord, and operating in manner and for the purpose as specified.

PADLOCKS—John A. Goewey, of Albany, N. Y.: I am aware that spring padlocks have been constructed to throw out their shackles, therefore I do not claim them broadly.

But I claim the combination of the tumbler, E, having attached to it the spring, F, with the tumbler, D, having attached to it the stump, G, when arranged and operated in the manner set forth.

ARMS OF BROADCAST SEEDING MACHINES—Henry J. Hale, of Indianapolis, Ind.: I claim the combination and arrangement of the segments, E E, and hinge, D, when constructed and arranged as and for the purposes set forth.

REFRIGERATOR—Samuel Hickok, of Buffalo, N. Y.: I claim the combination of the tube, B, arranged as shown, with the tank, A, when combined with the case G G G, for the purposes and substantially as described.

DOOR LOCK—Joseph S. Hoard and Valorus O. Spencer, of Mansfield, Pa.: We do not claim to be the first to introduce a sliding plate to close the outer key-hole, as this has already been done in several instances.

Neither do we claim placing the outer and inner key-holes in different transverse planes through the lock.

Neither do we claim, simply and broadly, preventing the bolt or the plate, H, by some sort of detent, from being slid back, as detents have been before used for this purpose.

But we claim, first, The combination of the key with the flange, h, and plate, H, by which the key is made to operate as a detent to prevent the return of the plate, H, which covers the outer key-hole, as set forth.

Second, The combination of the stop, j, upon the bolt with the key in such a manner that when the key is in the position represented in Figs. 3 and 5, the stop, j, will strike against the key and prevent the return of the bolt.

Third, The stop, i, on the flange, h, when combined with the key in the manner described, to prevent said key from being turned too far, as stated.

SOLE-CUTTING MACHINES—A. P. Howard and Allen Rowe, Jr., of Stoneham, Mass.: We are aware that two knives applied to a horizontal shaft, so as to project from opposite sides of it, and that to such shaft vertical reciprocating motions, as well as intermittent rotary motions have been given, so as to carry each knife in succession against a bed or piece of leather thereon. We do not claim such, as it differs materially from our invention.

But what we claim is arranging the sole-cutter on the lower end of and at right angles to a vertical shaft, and combining with such mechanism, not only for elevating and depressing such shaft in line of its axis, but mechanism for producing successive semi-rotations of such shaft and cutter, the same operating so as to carry the sole cutter toward and away from the bed, and to give to such cutter an intermittent rotary motion, in manner and for the purpose specified.

And in combination with the mechanism for elevating and depressing the cutter, and that for rotating it under an arrangement of the said cutter, with respect to its shaft, as specified, we claim the guide tooth, y, and the clutch recesses, x x, arranged to operate in manner and for the purpose as set forth.

We do not claim the combination of a sole-bender with a sole-cutter, unprovided with a sole discharger, as such is found in the United States Patent No. 11,147.

But we claim the combination and arrangement of the concave sole-discharger and the convex sole former or bender with the cutter, and so as to operate together, in manner and for the purpose specified.

DOOR SPRINGS—G. L. Hudson, of Conneaut, Ohio: I do not claim any of the described parts separately or in detail.

But I claim the use of the standard, A, coil spring, B, stirrup, C, crotch lever, D, connected with rod, F, link, F, as operating vice versa, to gate or door, G, the whole arranged or connected, and operating substantialy in the manner and for the purpose set forth.

LADIES' HOOP SKIRTS—Frederick Hull, of Derby, Conn.: I claim the combination of the sloping bustle springs, with the waist band, adjustable at the back and front, the whole arranged substantially as described, whereby the adjustment of the bustle is effected by the waistband alone.

SURVEYING INSTRUMENT FOR DETERMINING INACCESSIBLE HIGHTS AND DISTANCES—Marshall Angersoll, of Grafton, Ohio: I claim the construction of a surveying instrument for taking distances and altitudes upon the general principle set forth in the description and specification,

I claim, especially, the arrangement of the three sights, E F G, or their telescopic equivalents, one of which is adjustable upon a scale, by which means and the adjustment of a target having the same horizontal scale, the distance of any object within the range of vision can be determined.

In this claim I do not intend to confine myself to the precise arrangement set forth, but to use a telescope in which a similar adjustment of hair sights (or filaments of silk) are provided for upon a definite scale, as set forth; neither do I intend to confine myself to any particular scale, but to adopt a decimal scale, or any other that I may see fit.

I also claim, especially, a horizontal target, having marked upon it a scale corresponding to that of the accompanying instrument, which target is to be used in connection therewith, as described, the same forming a part of my invention.

I further claim the scale of altitude, in combination with the scale of distance to be used, in the manner and for the purpose specified.

DEEP SEA SOUNDING APPARATUS—Augustus Jonan, of San Francisco, Cal.: I do not claim the external form of the instrument; neither the mode of calculating the depth by the time of submersion; neither that as set forth, for testing the highest pressure.

I claim the combination and arrangement of the several essential devices described, operating in the manner and for the purposes set forth.

METHOD OF VARNISHING AND PROTECTING SURFACES—Frederic Kuhlmann, of Paris, France: I claim, first, The process described of fixing the surfaces of fabrics (fibrous or textile) or solid surfaces, as walls or masonery, by the application of a weak solution of an alkaline silicate, as the silicate of potash and soda, to said paint basis.

Second, I also claim for a similar purpose the method described of laying a coating of artificial leather, produced as set forth, over the surface of the basis pigment.

Third, I also claim the within described method of fixing and rendering printed papers and fabrics waterproof, and fixing the same by hot calendering.

Fourth, I also claim the described method of rendering the surface of plaster of Paris waterproof, and of preserving the same by forming a coating of artificial sulphate of baryta upon said surface.

[Professor Kuhlmann is one of the most distinguished French chemists, and his name has often appeared in our columns in connection with valuable discoveries and investigations.]

CHURN—Rufus Lapham and R. P. Wilson, of New York City: We claim the use of an exhausting or condensing pump, in connection with the cream reservoir as set forth, for the purpose of forcing air upon the upper surface of the cream, or withdrawing it from it, in the manner described and for the purpose set forth.

[This is a very novel mode of churning butter, to wit, by means of the combined action of compressed and expanded atmosphere and agitation in an air-tight vessel. The pressure when the air is compressed is exerted externally, and when it is expanded is exerted internally upon the globules or sacks containing fatty matter. By compressing the air in the air-tight vessel, the sacks are compacted together, and consequently, when agitated, are broken very readily, owing to their acting with friction against each other, and by exhausting the air from the air-tight vessel, the sacks are expanded by the air within them, and consequently can be very easily broken when agitated.]

WATER WHEEL—C. V. Littlepage, of Austin, Texas: I do not claim, separately, the curved buckets, f.

But I claim the wheel, G, provided with curved buckets, f, and attached to the shaft, E, stepped in the block, D, and otherwise arranged as shown, in connection with the spiral water passage, C, in the block or bed, D, the whole being arranged to operate as and for the purpose set forth.

[This is an improvement in horizontal water wheels, which are provided with curved buckets, and placed over a spiral water passage into which the water passes from the penstock, and acts upon the buckets as it passes through these buckets, the water being discharged at the outer ends of the buckets above the spiral water passage. The object of the invention is to relieve the stop or lower bearing of the wheel of the weight of the wheel and shaft, and the consequent friction attending its working, and also to obtain a large amount of power from the water supply.]

MACHINE FOR RIVING STAVES FROM THE BLOCK—L. Lyman, James P. Hodgkins, and E. Rawson, of Carthage, N. Y: We do not claim, broadly, the employment or use of movable or vibrating gages, for such device has been previously used.

But we claim, first, Having the tubes, j j, of the rods or gages, o o, fitted in blocks, k k, which are adjusted by the screws, l m, or their equivalent, for the purpose specified.

Second, Placing the rods or gages, o o, in tubes, j, in the lower end of which, springs, p, are placed, and on which springs, the rods, o o, rest, for the purpose set forth.

[The object of this invention is to obtain gages that will rise and fall simultaneously with the knife in order to perform their proper function without interfering with the operation of the knife, and at the same time admit of being set with facility for the purpose of cutting "stuff" of various thicknesses, and also to obtain gages that cannot be injured by the casual falling of the bolt upon them.]

ALARM CLOCKS—J. F. Mascher, of Philadelphia, Pa.: I do not claim either the rack, pinion, or snail separately.

But I claim the application of the rack, pinion and snail, in the manner set forth, to the going part of a clock or watch, for the use and purpose described.

PADDLE-WHEEL—John May, of Columbus, Ga.: I claim so applying and arranging a frame, I, outside of the wheel, and in combination with the axle, or center H, on which the floats rotate, or its equivalent, that the said frame may be turned about the wheel, and by being so turned will change the position of the said axle, or center, H, or its equivalent, relatively to the center of the drum, and thereby cause the floats to be projected from the drum, in such positions relatively to the axis thereof, as may be desired, substantially as and for the purpose set forth.

[This invention was noticed on page 283 of the present volume of the SCI. AM.]

HARVESTERS—Wm. K. Miller, of Canton, Ohio: I claim, first, The combination of the braces and rocking bar, substantially as and for the purpose set forth.

I also claim the adjustable hinge plate, K, for the purpose described.

And finally, I claim the combination of the shoe hinge plate, braces and rocking bar, substantially in the manner and for the purposes described.

STOVES—N. W. Northup, of Greene, N. Y.: I claim, in a stove constructed as described, the combination and arrangement of the partition, K, with the flues, H H, and dampers, I I, in manner and for the purpose specified.

SOOT AND SPARK ARRESTER—Washington Abram Peaslee, of Indianapolis, Ind.: I claim the combination and arrangement of the cap L, rod, H, walls, G F and Q, with the case or outer wall, C, files B and E, and wall, D, when constructed, arranged and operated, substantially in the manner and for the purposes set forth.

DEVICE FOR PREVENTING TREMULOUS VIBRATION OF SAW GATES—David Reynolds, of Ogden, Ind.: I claim combining the guide bar, D, and boxing, E, with the sash saw and fender posts, for the purposes set forth, and substantially as described.

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THE PROCESS OF MANUFACTURING CAUSTIC ALKALIES—Henry Pemberton, of East Tarentum, Pa. : Having thus described my improvement in the manufacture of caustic soda and other caustic alkalies, what I claim is the mode described of separating the solution of caustic soda, or other caustic alkaline liquid, from an insoluble precipitate, by the use of a filter, constructed substantially in the manner described.

HEEL AND SPOKE SHAVES—Joseph A. Perley, of Lynn, Mass : I claim the combination and arrangement of the adjustable gage, C, and beveled shanks, A A, substantially as described, so that the gage may be moved in a plane but slightly inclined to the convex side of the knife toward the edge or from it, for the objects specified.

CARPET-SWEEPER—N. B. Pratt, of Deep River, Conn.: I claim the arrangement of the bearings of the friction driving rollers, e e, in oblong slots, g g, of the box, A, and the rollers, d' d', in the specified relation to the ends of the revolving broom or brush, substantially as and for the purposes set forth.

[This invention consists in the use of a rotating brush cylinder, formed in two parts, and placed loosely on a stationary rod within a suitable box or case, the bottom of which is formed of yielding or elastic flaps or aprons, the edges of the aprons bearing upon the floor or carpet at either side of the point of contact of the brush cylinder with the floor or carpet. There is a roller at each end of the box, the axes of which are fitted in vertical slots in the ends of the box or case, so that the upper ends of the rollers will bear against the cylinders and rotate them as the device is moved over the floor or carpet.]

MANUFACTURE OF CHEESE—T. A. Redington and G. McCluer, of Fredonia, N. Y. : We claim the combination of the water box, A, milk vat, B, the reserve water box, G, boiler, E, pipes, g h j k, and the six-way cocks F, arranged to operate substantially as and for the purpose set forth.

[By a proper arrangement of hot water boxes, a boiler and hot water pipes, and a vat for containing milk, this inventor heats the milk to the proper temperature with great facility, and checks the heat at the proper point for the better production of cheese with a small amount of fuel.]

MACHINES FOR STRETCHING LEATHER—Albert W. Roberts, of Hartford, Conn.: I claim the constructing of the jaws of leather-stretchers with ways for the wedges to slide on, that the wedges may be so relieved from the leather when drawn back that the leather can be put in without removing the wedge from the jaw.

I also claim making the frames of hollow tubes on which the jaws slide, and also the application of steam to said frame, for drying purposes. Also the shaft and gears for throwing back the wedge, all of which is set forth and described.

CORN-HUSKERS—William N. Rowe, of Sharpsburgh, Md.: I claim the combination of the adjustable plate, K, armed with spikes, i, with the endless apron, I, and knives, D and E, when these several parts are constructed, arranged and operated in the manner described for the purposes specified.

SKATES—N. C. Sanford, of Meriden, Conn.: I claim attaching the runner, B, of the skate to its stock, A, by means of the springs, C C, substantially as and for the purpose set forth.

[The runner of the skate is, in this invention, attached to the stock by means of elliptic or other shaped springs, whereby a certain degree of elasticity is given to the stock. and a durable connection obtained between the runner and the stock.]

CAST IRON PAVEMENT—S. T. Savage, of Albany, N. Y. : I do not claim, broadly, the connection of the blocks by means of dovetails, nor by the detached locking pieces.

But I claim combining the blocks by the peculiarly arranged dovetails cast on the blocks, and the locking pieces composed of heads and feet fitting between the blocks and into their dovetails, substantially as described.

[This invention consists in a certain method of connecting or combining polygonal blocks to form a continuous cast-iron pavement by means of dovetails on the blocks, and locking pieces of peculiar construction fitting between the blocks and into the dovetail on it.]

REFRIGERATOR—Wm. Sims, of Dayton, Ohio : I claim the described arrangement of the ventilating passages, E and F, communicating with the upper part of a receptacle, C, in the lower part of which are placed ice and articles to be cooled or preserved, and in whose lower part circulation of air is avoided, in the manner and for the purpose set forth.

CORN SHELLERS—J. P. Smith, of Hummelstown, Pa.: I claim the arrangement of the groups of short teeth, f f, alternating with the smooth spaces, d d, which are provided with the raised ribs, g g, in combination with the sharp-edged teeth, h h h (with curved or straight edges), when arranged circularly in lines parallel with the axis of the wheel, and operating in connection with the ear-holder, D, so as to act on the ears of corn nearly lengthwise thereof, substantially in the manner and for the purposes specified.

REGULATING THE TWIST IN THROSTLE FRAMES—Joel Smith, of Northbridge, Mass. : I claim the expanding pulley, D, arranged to operate as described, for the purposes set forth in the specification.

GRAIN-WEIGHERS—John B. Stoner, of Bennington, Ill.: I claim, first, The rotary hopper, constructed and operating substantially as described.

Second, I claim suspending the rotary hopper upon the lever or scale arms, as set forth.

Third, I claim the arrangement of means described for operating and controlling the valve or door to the shute of the stationary hopper.

Fourth, I claim operating the indicators by means deriving their motions from the weighted end of the scale arms, in combination with the springs or their equivalents, as described.

Fifth, In combination with the suspending of the rotating hopper as described, I claim the suspending of the weight as described.

SLUICE FOR WATER WHEELS—John Temple (assignor to Temple, Mills & Stout), of Middletown, Ohio : I claim the winged gates, B C, constructed, arranged and operating in combination with a series of scroll shutes, A, substantially in the manner and for the purpose set forth.

WATER WHEELS—John Temple (assignor to Temple, Mills & Stout), of Middletown, Ohio : I claim the construction and arrangement in central discharge water wheels of buckets, E, which have the described compound cyma-reversa and downward and outward curve, whereby the water acts on the wheel by percussion, reaction and gravitation, and escapes freely without back action, as set forth.

MACHINE FOR TENONING SPOKES—Webster Thomas, of Oxford, Ohio : I claim the combination of the beds, I and B, constructed as described, with support piece, T, wedge, V, and the double series of cutters, d e, in the same cutter bearer, the construction and operation being as described.

REVOLVING FIREARMS—John Walch, of New York City : I claim the revolving chambers or breeches fitted with two ranges of nipples, and firing the respective charges in succession, substantially as specified.

LASTS—Daniel M. True, of Rockland, Maine : I do not claim the use of the bolt and spring to be used for a fastening, as new.

But I claim as a fastening for last blocks, the bolt a, when formed with the notches, f and g, and combined and arranged with the spring, b, the pin, c, and last hook hole, e.

UNDERGROUND GRAIN PLOWS—Augustus Watson, of Walnut Run, Ohio : I claim so hanging a coulter to which a mole is attached as that by revolving a key, or its equivalent, that restrains said coulter, and by advancing the plow, said coulter and mole will run out of the ground, substantially as described and represented.

APPARATUS FOR SUPPLYING HYDRO-CARBONS WITH OXYGEN—A. H. Webster, of Hudson, N. Y. : I do not claim, broadly and irrespective of the means employed, supplying hydro-carbons with oxygen by mechanical means.

But I claim the bellows, B B, actuated by the tappit wheels, D D, and attached to the chest, C, provided with a cover or weight, d, and an eduction opening, e, combined and arranged to operate as and for the purpose set forth.

[Coal tar, naphtha, benzole, and other hydro-carbons, require a certain amount of oxygen over and above common fluids and oils, for their consumption, and this invention supplies it to them by mechanical means, to support proper combustion in such a regular manner that a steady flame will be produced without the least flicker.]

BEE HIVES—William L. West, of Elmira, N. Y.: I claim the use of the opposing springs, d d, for the purpose of insuring a contact of the parts contiguous to the passage-way, c, substantially as described.

APPARATUS FOR DRAWING WATER—Sylvanus A. Wheat, of Franklin, N. Y.: I claim giving the barrel a longitudinal motion on the shaft, also connecting the valve to the rope by the rod, substantially for the purpose described.

ELLIPSOGRAPH—Thomas Williams and William C. Joslin, of Fisherville, Conn.: We claim the slotted bar, A, provided with the slide, B, the arbor, c, passing through the slide, B, with the disk, C, and slotted bar, D, attached, and the elastic bar, G, pivoted to the bar, A, and connected eccentrically with the disk, C, the bar, D, having the pencil stock, E, attached, and the whole arranged substantially as and for the purpose set forth.

[This invention consists in having a slotted bar supported by legs, and a slide fitted into the slot, the slide having the axis of a circular disk passing through it, to the lower end of which axis a bar is attached carrying an adjustable pencil stock. The disk is perforated with holes, in any of which the pin of an arm which is pivoted to the slotted bar may be fitted, the whole being arranged to draw ovals with great facility.]

BURGLAR'S ALARM—John P. Wilson, of Frankfort, and John F. Thomas, of Ilion, N. Y.: We do not claim securing the alarm by means of a screw to the casing of the door, or the use of firearms, a, as a means of alarm and defense in cases of attempted robbery.

But we claim first, The employment in connection with the described gun alarm, of an adjustable gimblet screw, D, which is secured in a dovetailed groove in the body while in use, and which is secured in the barrel or bore by a screw when not in use, substantially as is set forth.

Second, The employment of the two sides, A' A', between which the hammer falls, which serve to prevent particles of the cap from flying off, and at the same time forming a snug protection for the hammer, and causing a louder report of the cap, as is fully set forth.

ODOMETER—Thomas K. Work, of Hartford, Conn.: I claim the curved or segment weight, m, pivoted to the arm, l, which is attached to the pinion, e', and fitted between the annular ledges, n o, substantially as and for the purpose set forth.

[This improvement in the odometer is intended to prevent any inaccuracy in the registration of the distance, by the jolting of the weight, when the vehicle passes over uneven roads.]

INSTRUMENT FOR TAKING ALTITUDES OF THE SUN—Frederick Yeiser, of Lexington, Ky.: I claim the arrangement of the spirally slotted cylinder, L, on a rotary frame, E, in such relation to a pin, G, and to a strongly defined line, 3 4, that it operates substantially as and for the purposes specified.

And in combination with the rotary frame, E, I also claim operating the cylinder, L, by means of a toothed sector, I, which gears into cogs, J, which are attached to the stationary disk, C, in the manner and for the purpose substantially as described.

[By this instrument, the plane of the meridian can be determined at any time in the forenoon or afternoon, so that observations can be taken with it at any time in the day when the sun shines, and not at noon only, as is the plan now adopted.]

MECHANISM FOR STOPPING WATCHES—John K. Bigelow (assignor to Appleton, Tracy & Co.), of Waltham, Mass.: I claim the peculiar mode of making the ratchet, viz., with trapezoidal teeth, and with a notch in each of them, as described and represented.

I also claim the arrangement or application of the stop lever, E, with respect to the stopping stud and the ratchet, or so as to serve not only as a carrier and actuator of the former, but as a stop to the latter under circumstances as specified.

SEED DRILLS—Michael Boyer (assignor to Charles S. Rohner and William Gunckel), of Germantown, Ohio: I claim arranging the spring, C, ratchet wheel, b, ratchet, a, link, D, drag bar, A, arm, E, and discharge spout, B, substantially in the manner and for the purpose specified.

STEAM CONDENSERS—John N. Dennison, (assignor to himself, Joseph Dennison and David Baker), of Newark, N. J.: I claim a feed-pump with its attachments and connections, substantially as described, in combination with a condenser, constructed and arranged as set forth.

STUMP-EXTRACTORS—E. B. Hall, of Woodbury, N. J,, (assignor to himself and Joseph C. Farley, of Pine Grove, N. J.: I am aware that in the stump extractor for which letters patent were granted to Jason S. Wood, on the 3d February, 1857, cams, in conjunction with other appliances, are used. I, therefore, do not claim broadly, such a device, but I claim, as an improvement on the patent of J. S. Wood.

The cam, J, when constructed in the peculiar manner herein described, in combination with the rods G and G', their rejective rollers and hooks, K and K', the whole of the above parts being arranged in respect to each other for joint action, substantially, as set forth,

DIES FOR CUTTING SCREWS—Peter Hoffman, of Rising Sun, Ind., (assignor to himself and Samuel F. Covington, of Indianapolis, Ind. : I claim the construction of a solid die, in which the bottom of the groove is so thrown up in the rear of the cutting-point or edge of the same, as to avoid the friction occasioned by the rubbing upon the top of the thread, of the bolt cut or threaded.

KNIFE-SHARPENER—Geo. Himman, (assignor to himself and Charles Monson, of New Haven, Conn. : I am aware that the cutting edges set at different angles have been used for knife-sharpeners, for many years, but in all such cases the angle varied as the cutting edges were more or less separated at the upper ends.) I therefore do not claim a knife-sharpener made of two pieces of steel, with the edges fitted to abrade the sides of the edge of the knife, as such, as my invention.

But I claim the use of the two cutters (B and C) when made susceptible of being adjusted to any desired angle, by means of a slot (as at a) while using any portion of the length of the cutting edges, and the whole is constructed and made to operate, substantially, as described.

Second, I also claim the rest, D, in combination with the adjustable cutters, B and C, when the whole is constructed and fitted for use, substantially as described.

SELF-ACTING CHEESE-PRESS—William Leach. of Clarkson, N. Y., (assignor to himself and George P. Tisdale,) of Chili, N. Y. : I do not claim simply a self acting press, but I claim the pitman, D, D, arranged substantially, as described, in combination with the pairs of cross levers, B, B, so as to keep said cross-levers at equal heights at opposite ends of the press, and consequently at the same relative angle to the table, A, in all positions, for the purpose of securing uniformity of pressure upon all parts of the articles pressed.

I also claim the combination of the rod, l, handle, r, and pawls, m, m, mounted in one pair of cross-levers, B, B, with the notches, o, o, o, or their equivalents, in the other pair of cross-levers, arranged and operating substantially, in the manner and for the purpose set forth.

MOLDING PARAFFINE CANDLES—Horatio Leonard, (assignor to himself and H. Ryder), of New Bedford, Mass. : I do not claim manufacturing candles by means of molds; but I claim in molding paraffine candles, the improved process, substantially, as described, the same involving the employment of a heated mold and water and air-baths at temperatures and in the manner substantially as mentioned,

METHOD OF COVERING WITH FIBROUS MATERIAL SUBMERGED SPIRAL ELECTRODES FOR SHORT DISTANCES—Edward Maynard, (assignor to himself, N. K. Slaughter and Thomas E. Purdy,) of Brooklyn, N. Y.: I claim constructing submarine telegraph cables of metallic conductors, twisted in helical form, in combination with layers of cords or strings, parallel, or nearly so, with the axis of the cable, that are confined together, by serving or winding, and are saturated with waterproof non-conducting material, as set forth.

BOOT-JACK—L. J. Wicks (assignor to himself and T. Burbeck), of Racine, Wis. : I claim the described boot-jack, as a new article of manufacture, with the tools formed on the rear or front of its arms, said arms being made to open or shut to together, substantially in the manner specified.

RE-ISSUES.

IMPROVED STEAM VALVE—George Rieseck, of Pittsburg, Pa. Patented Aug. 15, 1858 : I claim, first, The valve, D, with a projecting hollow stem, E, which is reduced so that its end presents an area only equal, or nearly so, to the receiving ports in the face of the valve in combination with the main steam chest, or chamber, J, and an auxiliary steam chest or casing, I, furnished with a stuffing-box, d, and constructed so as to cover the whole of the valve, excepting the end of the stem or a portion of the back equal or nearly equal to the receiving ports in its face, substantially as and for the purposes set forth.

Second, In combination with the above, the peculiar manner specified of making the face of the valve, with six ports, F F1 F2, G G1 G2, three for receiving and three for exhausting, said ports being arranged in such relation to each other, that when the valve is applied to an oscillating engine, one receiving port always stands in line with the exhaust port, and that only four of the ports shall be in use when the engine is working, the other two being kept in reserve, so that by shifting the valve the engine will be instantaneously reversed under a full pressure of steam, without shutting off the steam between the engine and the boiler, as described and set forth.

MACHINE FOR THREADING BOLTS—Wm. Sellers, of Philadelphia, Pa. Patented Dec. 1, 1857 : I claim the use of rotating dies in combination with cams, or their equivalent, when both are so arranged as to be capable of revolving about a common center at different velocities, for the purpose of opening and closing the dies, substantially as described.

I claim the arrangement of cams, with the open spaces between them, in combination with the die box and dies, substantially as described, to facilitate the changing of the dies.

I also claim the mode of attaching the top-holder to the revolving die box, substantially as described.

BOXES FOR PRESERVING ALKALIES—George Thompson, of East Tarentum, Pa. Patented Sept. 15, 1857 : I claim the use of metallic boxes constructed as described, and united with cement infusible at the degree of heat at which the caustic alkalies of soda and potassa remain fluid for the purpose of putting up those caustic alkalies in small quantities, as described.

SELF-DUMPING COAL BUCKET—John Wust, of Philadelphia, Pa. Patented July 13, 1858: I claim the combination of a bucket suspended by the handle at points below its center of gravity, in combination with a self-acting detachable latch operated by the bucket touching the ground.

LAMPS—Wm. W. Batchelder, of New York City. Patented Dec. 28, 1858 : I claim the arrangement of small tapers or wick tubes below and on both sides of the main or illuminating burner, in combination with a suitable cap, for the purpose of producing a more complete combination, substantially as set forth.

MACHINE FOR FOLDING PAPER—S. T. Bacon, of Boston, Mass., assignee of E. N. Smith, of Springfield, Mass. Patented May 17, 1858 — Re-issued Feb. 8, 1859 : I claim, first, The employment of adjustable points or register pins, or their eqivalents, for the purpose of correctly presenting printed sheets to a passer folding machine, substantially in the manner and for the purpose set forth.

Second, The combination of a registering apparatus with a paper-folding machine, substantially in the manner described.

Third, The combination of the register pins with the fingers, reciprocating carriage, and slotted bar, for the purpose specified,

Fourth, The combination of the slotted reciprocating carriage, with the knife, d, as described.

Fifth, The combination of the slotted reciprocating carriage with the first pair of folding rolls and knife, d, as specified.

Sixth, The combination of a folding knife, the edge of which is smooth, with one or more needle points projecting beyond and in a line with the edge thereof, as shown.

Seventh, Securing the needle point or points to the folding knife in such a manner as that they shall have their main support back of the edge of said knife, as specified.

Eighth, So constructing paper folding machines, as that the sheet while being folded shall occupy the same time or nearly so, while passing from the position for receiving its first folds to that of the next and succeeding folds, as specified.

MACHINE FOR FOLDING PAPER—Steuben T. Bacon, of Boston. Mass., (assignee through mesne assignment of John North, of Middleton, Conn. Patented, April 15, 1856—Re-issued, July 27, 1858 : I claim the use of a stationary folding-knife in a machine for folding printed sheets of paper, substantially, as described, and as the invention of the said North.

I also claim the combination of the folding-knives, k, k, with the reciprocating carriage, as set forth, and as the invention of said North.

I also claim giving the reciprocating carriage its proper motion by means of the crank, k, and slotted connecting-rod, M, in combination with the lever, N, and link, P, substantially as described, and as the invention of said North.

I also claim the device for raising and depressing the fingers, as fully shown in Fig. 6, and as the invention of said North.

I also claim the combination of the folding and carrying nippers, with the stationary folding-knife; substantially, as described, and as the invention of said North.

I also claim releasing the sheet from the nippers by means substantially, as described, and as the invention of the said North.

I also claim the circular knives, c', c', for separating the sheets, when operated substantially, in the manner described, and as the invention of the said North.

I also claim the combination of the levers, T and T', with double concentric rock-shafts, D and E, substantially, in the manner and for the purposes set forth, and as the invention of said North.

I also claim the adjustable check, and the mode of releasing its hold by the advance of the nippers, as set forth.

MACHINE FOR FOLDING PAPER—Steuben T. Bacon, of Boston, Mass., (assignee through mesne assignment of Edward N. smith), formerly of West Brookfield, Mass. Patented Nov. 27, 1849—Re-issued, January 7, 1851: I claim, First, Forcing the paper required to be folded between the first set of folding rolls by the knife, while the sheet is on the run.

Second. Forcing the paper from the first fold between two converging and continuously moving, flexible, yielding surfaces.

Third. Forcing the sheet of paper required to be folded, upwards, for the purpose specified.

Fourth. The use of a cord, or curved edged knife, for the purpose of forcing the sheet between folding rolls.

Fifth. The stop for determining the proper position of the sheet ror receiving its second and succeeding folds.

Sixth. The combination of the carrying bands with a stop for regulating the sheet in proper position to receive its second and succeeding folds, as specified.

Seventh. The combination of the rolls and endless or bands with the guides, substantially as described.

Eighth. So arranging the knives, aprons and rolls, in a paper-folding machine, as that the sheet may receive two or more parallel folds in succession.

Ninth So arranging the carrying and folding rolls in a paper-folding machine as that only a single series of endless aprons or bands shall remain in contact with the sheet, to conduct it while it is receiving more than one fold.

Tenth. The lightening pulleys and cords or bands hung upon the moveable bar, for the purpose of giving proper direction to the sheet receiving the next fold, after having received a parallel fold as described.

Eleventh. So conducting a machine for folding paper, as that one or more folds may be omitted at pleasure, and the folded sheet delivered outside of the frame and working parts of the machine, by simply detaching the knives and removing the stops as described.

Twelfth. Supporting the folding rolls in adjustable boxes, bearings or frames, for the purpose of squaring them with the print or register of the sheet to be folded, and providing for the construction and expansion of the endless aprons or bands.

Thirteenth. The movable guides for the purpose of squaring the knives to correspond with the print or register of the sheet.

Fourteenth, Conveying motion to any pair of folding rolls, running at right angles to the preceding pair by means of lovel gears placed at or near the center of a roll. and between the aprons or bands, substantially as shown, whereby the machine is rendered more simple and perfect in its operation,

Fifteenth, Pressing the folding sheet previous to its delivery, by passing it between two conveying and continuously moving yielding surfaces.

DISTILLATION OF OILS FROM COAL—David Alter and Samuel A. Hill, of Freeport, Pa., assignors to themselves, John T. Johnson, of said Freeport, William F. Johnson, George S. Selder, and John L. Russell, of Pittsburgh, Pa. Patented April 27th, 1858 : We claim the destructive distillation of coal, or other bituminous substances, for the obtaining the liquid products therefrom, in the form of what is known as coal oils, by the process described, viz., combining the use of a low temperature not exceeding a low red heat, say about 850° Fah., with the use of retorts so constructed as to have a retary, or other equivalent motion, for the purpose of agitating their contents, substantially in the manner and for the purposes set forth.

INVENTIONS EXAMINED at the Patent Office, and advice given as to the patentability of inventions, before the expense of an application is incurred. This service is carefully performed by Editors of this Journal, through their Branch Office at Washington, for the small fee of $5. A sketch and description of the invention only are wanted to enable them to make the examination. Address MUNN & COMPANY,
No. 37 Park-row, New York.

Agricultural Implements.

MESSRS. EDITORS—In answer to the communication of T. Waters, of Shopspring, Tenn., in the SCIENTIFIC AMERICAN for January 8th, I have to state that the invention of a harrow such as he described is as plain as the arithmetical axiom, 2×2=4. I do not think, however, that it can be made so as to last very long, for $25. Twice that sum would insure an article out of which he could "get his money's worth."

In this connection let me state that farmers are altogether too close-fisted in bargaining for tools. Instead of considering the value of the improvement in their land which a good tool is sure to effect, they lose sight of everything but the money they pay out, or are apt to look on the transaction of buying an agricultural machine as paying forty or fifty dollars for so many pounds of iron, steel, and wood. With this idea, they offer, in nine cases out or ten, a price which compels the manufacturer to offer an almost worthless article, in order to get a fair living price. The fate of cobbled-up articles in the hands of farm laborers is not hard to tell: rough usage till it breaks (generally not very long), and then an energetic denunciation, with a shove into a corner.

J. H. B. JENKINS.

Philadelphia, February, 1859.

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New Inventions.

Music Notation.

When children are learning music they experience much difficulty in fixing on their memories the names of the notes, and their several positions on the scale; and many a child, or even adult, becomes discouraged before they have acquired the rudiments of the science, and give it up in despair. To facilitate the learning of music, and the reading of it at sight, a blind gentleman, Mr. Cornelius Mahoney, the teacher of music in the institution for the blind, in this city, has invented a system of notation that deserves to come into general use. He has the name of the note cut in the note, itself, showing white in the black notes and black in the white ones, so that at a glance, the name of the note can be seen. The same gentleman is also the inventor of embossed music for the blind, by which any blind person can read the music by touch and will not require a second person to read them, as was formerly the case; thus placing this charming solace and divine consoler, sweet melody, within the reach of that class who need it most—the blind. This is a valuable and humane invention and we hope it will be adopted in all the institutions for the blind.

New Steam Valve.

A suspended segment or convex valve and a concave valve-seat, are used by this inventor—H. D. Wickes, of Flint, Mich.—and a steam-chest is dispensed with, so that the construction of the engine is simplified, and the steam is made to act upon the valve in such a way that all unnecessary pressure of the valve upon the seat is obviated, all binding of the axis of the valve removed, and every facility offered for adjusting the valve to the seat. The invention will be fully understood from the following description and accompanying illustrations.

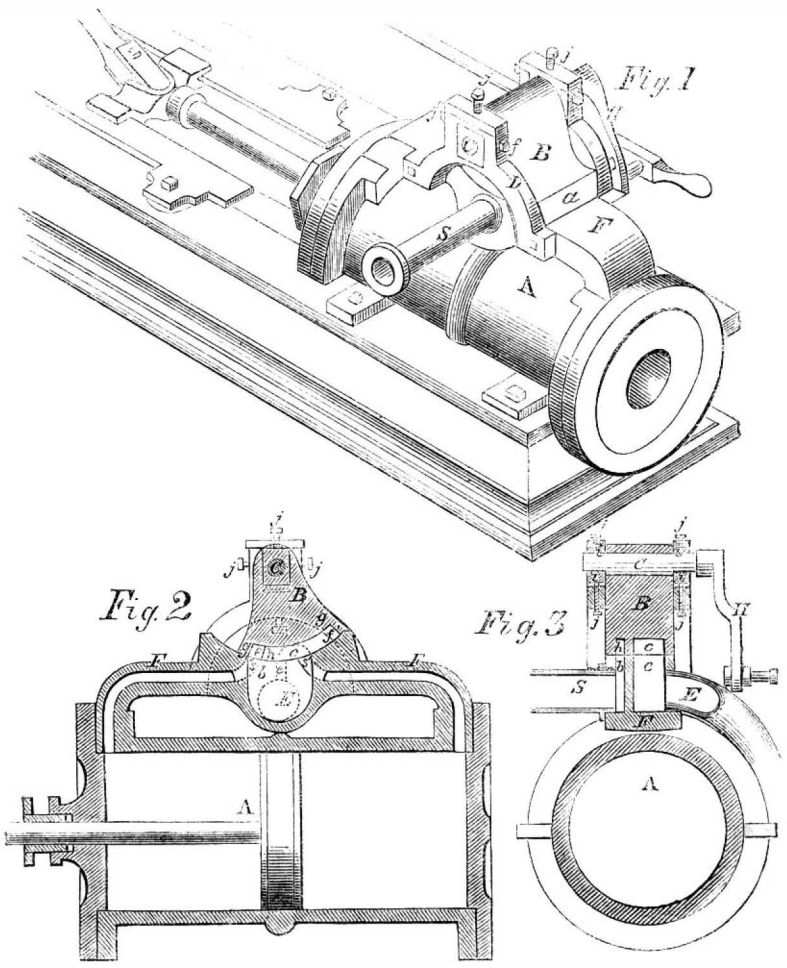
Fig. 1 is a perspective view of a horizontal steam engine, with this invention applied. Fig. 2 is a longitudinal central section of the cylinders and valve, and Fig. 3 a transverse section of the same.

A is the cylinder, and B is the valve. The valve is attached to a rock-shaft, C, which is fitted to work in bearings in frames, D D, bolted to the engine cylinder, and derives an oscillating motion from an eccentric on the crank-shaft of the engine, or through other suitable agency. H is an arm attached to the rock-shaft, for connecting it with an eccentric. The face of the valve is of the form of an arc of a cylinder, generated from the axis of the rock-shaft, C; and the valve seat, *a a*, is of corresponding form. The valve seat contains two steam ports, *s s'*, and an exhaust port, *e*, arranged in the manner common to reciprocating engines, the steam ports communicating with the two ends of the cylinder, and the exhaust port with the exhaust pipe, E, which is attached to the passage box, F. Besides these ports there is a third port, *b*, arranged longitudinally in the valve seat at one side of the ports, *s s' e*, and extending the whole width of the ports, and spaces between them, this port communicating with the steam pipe, S, which is secured to the opposite side of the passage box, F, to the exhaust pipe, as shown in Fig. 3. The valve contains the exhaust cavity, *c*, common to the short slide valve, and the usual width of face, *d d*, on each side of it, and is extended beyond *d d* far enough to contain two ports, *f f'*, corresponding in width with the steam ports, *s s'*, with a proper width of face, *g g*, outside of the ports, *f f'*, and these ports communicate both with a longitudinal cavity, *h*, which ranges over the port, *b*, of the seat.

The operation is as follows:—Steam is admitted by the pipe, S, and port, *b*, to the cavity, *h*, of the valve, which is always filled, thus constituting a steam-chest. From the cavity, *h*, it is admitted by the oscillation of the valve from the ports, *f* and *f'*, to the steam ports, *s* and *s'*, of the cylinder, alternately; and while steam is being admitted to one end of the cylinder through the port, *s* or *s'*, it is exhausting through the other of the said ports, and through the cavity, *c*, of the valve, the port, *e*, and exhaust pipe, E.

During the operation of the valve, the pressure of steam on the valve tends to force it from the seat; but this is counteracted by fitting the journal boxes, *i i*, of the valve rock-shaft to the frames, D D, in such a manner as to provide for their adjustment by screws, *j j*, so that the valve may be confined to its seat, and these screws are so set as to prevent unnecessary friction between the valve and seat.

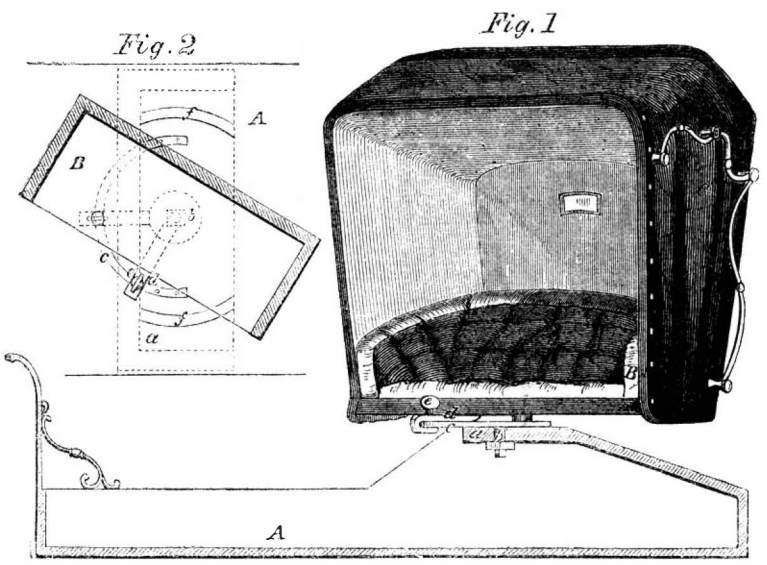
WICKES' STEAM ENGINE VALVE.



To apply the invention to an oscillating engine, the valve is made stationary, and with its face concave to fit a seat on the cylinder in the form of an arc generated from the axis of oscillation of the cylinder, and the steam and exhaust pipes are attached to the valve instead of to the cylinder; the steam pipe being attached to communicate with the cavity, *h*, and the exhaust pipe with the cavity, *c*. The cavities and ports of the stationary valve are the same as those in the oscillating valve of the stationary engine represented, but the ports, *b* and *e*, in the cylinder, are dispensed with.

It was patented December 14, 1858, and any further information can be obtained from the inventor, by addressing him as above.

POTTER'S REVOLVING CARRIAGE SEAT.



It is very often the case that in riding in a covered wagon, the cover is no protection against the inclemency of the weather, as the rain, snow, or sleet, may beat from the side, and render the voyagers as uncomfortable as if there was no protection over their heads. To prevent this by providing a carriage seat which may be turned cover and all in any position, H. H. Potter, of Carthage, N. Y., has invented the subject of our illustrations, Fig. 1 being a perspective view of the cover, and Fig. 2 a horizontal cross section. The back or covered side can always be placed against the wind, and the seat affords a greater facility for getting in and out of the vehicle, as the seat can be turned half round while ladies are ascending the step, and adjusted to its proper position when they are fairly in.

A is the body of a pleasure wagon and B its seat provided with a calash top. The body has a transverse peice, *a*, on its upper part, to the center of which the seat, B, is attached by a bolt, *b*, so that the seat may turn on the bolt as a center. To the transverse peice, *a*, a semi-circular plate, *c*, is attached, concentric with *b*. To the underside of B a plate, *d*, is secured, and it projects a little beyond the front of the seat, its front end being bent into the form of a hook, so as to catch *c*; *d* also carries a set screw, *e*. On the transverse peice, *a*, segment plates are secured, and corresponding plates are secured to the underside of B. The seat, B, may be turned either to the right or left, and secured at the desired point by the set screw, *e*. By turning the seat obliquely with the body, A, a person may get in or out from the body, A, with the greatest facility, and in case of a horse running away or becoming unmanageable, persons may readily get out from the body and reach the ground with less danger than by jumping over the wheels. The tops of the seats are generally a great barrier to the ready getting in and out of vehicles, in consequence of the top projecting over the front of the seat. By turning the seat obliquely, this difficulty is obviated, and aged and infirm people can get in and out of the body without trouble. The seat can also be made to shelter from the sun as well as rain. It was patented Dec. 14th, 1858, and any further information concerning this truly ingenious and useful device, can be obtained by addressing Potter & Blake as above.

Steam Plow.

S. K. Basset, of Galesburgh, Ill., has invented a new steam plow, in which the wheels of the track of a traction steam-engine are so arranged that the track may be readily guided and turned, and the engine rendered available for drawing a gang of plows to turn over the earth in the usual way. The invention also consists in a peculiar manner of attaching and applying the gang of plows to the track; also in the employment of track clearers, arranged in a novel way, and in so attaching the boiler to the track that it is allowed to remain in a horizontal position when the track rises and falls in corresponding with the inequalities in the surface of the ground. It was patented this week.

The Cigar Steamer a Failure.

The Baltimore *Sun* states that "Messrs. Winans, acting upon the improvements suggested by the late trial trip, have concluded to lengthen the cigar steamer thirty-nine feet. This will be accomplished by cutting off twenty-five feet from the bows, and adding the required number, gradually tapering to the prow. The extra sheeting required for the work is now being prepared at the machine-shop of Messrs Winans at Mount Clare. Some alterations, at the same time, will be made in the motive power, by which it is believed the speed of the vessel will be increased. The addition will be completed before the spring."

If this steamer had answered all the expectation of its designers, the above alterations would not have been made. If Messrs. Winans will put a keel on their steamer, decrease the rise of its floor somewhat, and run up the sides of the bow to prevent it burrowing in the waves, then remove the propeller to the stern and greatly diminish its size; they will have a steamer of a good and common model, which will do them essential service, provided the engines and all the other parts are properly constructed and arranged.

ILLUSTRATED SUPPLEMENT.—With our next number we shall issue an Illustrated Supplement of the SCIENTIFIC AMERICAN, containing engravings, and a description of one of the largest manufacturing establishments of its kind in the United States; and in the course of three weeks we hope to have another Supplement ready, which will contain information of great interest to inventors and patentees.

There are now 43 drinking fountains in Liverpool, England, and it is estimated that 1,000 people drink daily at each. This is true temperance—practical philanthropy.

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Scientific American.

NEW YORK, FEBRUARY 19, 1859.

REMOVAL.

The SCIENTIFIC AMERICAN *Office has removed from its old location,* 128 *Fulton st. (Sun Building), to No.* 37 *Park Row (Park Building), where all letters, packages, and models should hereafter be addressed. Entrance is had to the Office also at No.* 145 *Nassau st. Munn & Co.'s American and European Patent Agency is at the above office.*

Sewing Machines.

We are not afraid to confess it. We have an intense respect for John Bull. There is an amount of steady jollity and sincere good humor in him that makes us like him, and his great solidity of character commands our highest esteem. Therefore, we are careful seldom to say anything against him, or to rake up old sores, and blister the ancient wound. We prefer to act rather as a healing salve among the nations, and to write with the intention of promoting universal good-will. We never liked to tell John that he was a slow coach, but have always admired his unvarying speed. What was our surprise, then, to find in a recent number of the London *Engineer* an article on "Sewing Machines," which contains the following sentences: "Somehow or other, however, the invention seems to have spread slowly, and it is better known through the quarrels of the inventors than by any useful effects it produces." And again: "They seem, indeed, never to have got into the ordinary category of trade. No manufacturer tells you in an honest and straightforward way at what price he will supply his machines. One would imagine, indeed, that the whole business was spell-bound—that the wonderful machine had only been employed in sewing ligaments for the inventor's energies, and in stretching toils from which he could not escape."

We ask, in amazement, "Is this the progress the sewing machine has made in England?" Why, Uncle John, you have had the invention as long as we have, and have done nothing with it! It is your own confession, not any invidious remark of ours. Listen, while we tell you what *we* are doing with the sewing machine, and it may, perhaps, stimulate you to give up law and turn to manufacture. For the benefit of the poor needlewomen, for the cause of humanity, for the prevention of the horrors which your own Tom Hood described in his "Song of the Shirt," we hope it may!

Messrs. Wheeler & Wilson made and sold during the last three months 4,700 machines, and are now producing and selling 100 per day. They vary in price from $50 to $100, and the highest priced ones sell best. In their business there is over $500,000 invested, and they keep over 400 men regularly employed manufacturing machines. The system pursued is the same as that adopted in the manufacture of arms, every piece is made to a gage, and consequently the parts of any machine may be transposed with those of another machine of the same size; or should an accident occur, the broken part can be immediately replaced on application at the office.

Messrs. Grover & Baker manufactured and sold in 1858 fourteen thousand sewing machines, and more of the $100 ones than any other price. Their factory is at Boston, but in this city they employ 150 cabinet-makers to produce stands and ornamental covers for the machines sold. They sell a great number in South America, and many are bought here and carried to England by persons returning or going to live there.

Messrs. I. M. Singer & Co. produce and sell about 350 machines weekly, and they are now making arrangements to increase their manufacturing facilities. The prices of their machines vary from $50 to $125, and two-thirds of their sales are those of the highest price. Messrs. Singer & Co., taking advantage of the fact that Howe's English patent (now owned by Thomas, of London) does not cover Scotland and Ireland, have a branch establishment in Glasgow, and in the last year they sold machines in that city to about the amount of £25,000, thus proving that in the old country, wherever "Yankee Doodle" as we are familiarly called has a chance, he can make money and give value received.

There is not an establishment in this country where stitching of any kind is required in which the sewing machine is not employed, and there are few private families in which it is not an acknowledged article of furniture. It is impossible for us to estimate the number of other machines sold weekly in the United States, but when we mention the fact that a machine may be bought in New York or any other city in the Union from $5 upwards, it will not be considered an exaggeration, but considerably under the mark, when we say that over 1,500 sewing machines are sold weekly in this country.

Now, what is the cause of this difference? Why is it that, as the *Engineer* tells us, the sewing machine in England is a nut for the lawyers to crack and run off with the kernel, while here it is an increasing article of manufacture and a blessing to the community? We think we can solve the question in a few words. Firstly, the superiority of our patent laws, which, by our system of examination before granting a patent, prevents much litigation; and, secondly, the conservative feelings of the English people render them unwilling to adopt a machine which will do that in a few minutes which, for centuries, it has taken their hands many hours to accomplish.

In a quiet, friendly way, Uncle John, looking at your patent laws and many social evils, (confessing, at the same time, that we have some, too,) we ask you, as the older man, the more experienced social philosopher and political economist, from this sewing machine contrast, to aid such men in your midst as your social science philosophers—Lords Brougham and Russell, to wit, and cease playing with the great obstruction to your progress—conservatism; but in the words of your own great poet—

"Reform it altogether."

The Winds.

The ancients believed that the winds issued from a cavern at the command of Jove, and that they were under the control of four deities, to whom the Phœnicians, Greeks and others erected temples. We now, however, know that wind is merely air in a state of motion, and that by waving the hand to and fro, or blowing our breath, we may produce wind on a small scale. When the air, at any particular place, is heated by the direct action of the sun's rays or radiation, it rises because of its lightness, and cold air from the surrounding localities rushes in to fill its place. A common door will illustrate this; if we partially open the door of a warm room and hold a light near the top, the flame will be blown outwards by the heated air escaping; and if we hold the light near the bottom, the flame will be blown inwards by the cold air that is rushing in to supply the place of the heated air that has escaped. In particular parts of the tropical regions, where the air becomes highly heated by the sun, there is a constant rushing of air to these points, from east to west, and this causes the *trade winds*, so called because taken advantage of by merchantmen on the Atlantic and Pacific Oceans. They blow in the same direction for months together.

This local action of the sun on vast areas of land and water produces several other important winds, such as the *monsoons*, which blow from the south to the north, being trade winds turned round by the heat of land lying within the tropics; the *simoon* is a burning blast that rushes over the Arabian deserts, carrying on its wings fine sand, and destroying all that venture to oppose its power. The *harmattan* is a cold dry wind frequent in Africa and is nearly as dangerous as the simoons. The *sirocco* visits Italy, with a hot, moist and relaxing blast from the African shores of the Mediterranean; and *whirlwinds* and *tornadoes* are common to all climates, but most destructive in hot ones.

Notwithstanding the seemingly terrible nature of these winds, they, with the milder ones, have important parts to play in the great economy of nature, in dispersing the clouds over the surface of the earth, and purifying the atmosphere from noxious vapors and effluvia; they also disperse the seeds of plants, and, as aids to civilization, impel ships across the seas, and move machinery.

Steam on the Erie Canal.

A bill has been introduced into the Legislature of New York, by Mr. Prosser, of the Senate Canal Committee, which bill has for its object the encouragement of using steam as the motive agent in canal navigation. It provides that boats propelled by steam power on the canals shall be allowed to run at the rate of five miles per hour—four miles being the *maximum* speed at present allowed; also that all other boats shall give way for their passage in the same manner as freight boats were required, "a long time ago," to stand for packets. Steam is undoubtedly destined to supersede horse-flesh entirely, at no distant day, on our canals, and this measure looks like a move in the right direction to secure this end. Boats of good model, propelled by screws, can run on the canal at the rate of seven miles per hour, and cause no more swell to injure the banks than the old bluff-bow barges running at the rate of three miles per hour. It is many years since we first urged the importance and necessity of steam for canal navigation; we are glad to perceive the truth finding its way up into our legislative hall, however tardy it may have been in reaching such a source.

Patent Law—Returning Money.

In the Senate, on Feb. 2d, Senator Reid, of the Committee on Patents, to whom was referred a bill for the relief of the widow of Charles Pearson, reported the same and recommended its passage. Some objection was made to its consideration, but he said "It is a clear question. It is merely to refund some money paid into the Treasury by an insane man, who made application for a patent. I trust the amendment will be adopted, and the bill suffered to pass."

Mr. Hale said: "It is simply to return $150 to the widow of a poor insane man, who paid money into the Patent Office. The Commissioner wants to repay it, but he is not authorized by law to do it.

The bill was amended so as to grant $140 to the "legal representative" of Charles Pearson, late of Concord, N. H., and then passed.

There is certainly a very great defect in some points of our patent laws when, in such a case as this, money has been paid into the Patent Office by mistake, and cannot be refunded otherwise than by a special bill of relief brought into the Senate. We hope our present Congress will see the necessity of making some amendments to our patent laws.

Cunning Adulteration of Gold Coin.

An Italian woman was taken into custody in this city last week, for passing gold coins that had been adulterated in the following ingenious manner:—Genuine half-eagle ($5) pieces were sawed through the middle on the edges, about one dollars' worth of gold taken from each, and its place filled up with base metal. The two halves of the coins were then united together again, and the edges re-milled so skillfully that it was impossible to detect the forgery by mere inspection, as the faces not only bore the impress of the genuine articles, but really were such.

M'CORMICK'S EXTENSION CASE.

COMMISSIONER HOLT'S DECISION.

UNITED STATES PATENT OFFICE,
January 28, 1859.

On the application of CYRUS H. MCCORMICK, *for the extension of a patent granted to him on* 31*st January*, 1845, *and re-issued on the* 3*d of August*, 1858, *for Improvement in Reaping Machines.*

In our country of fertile and cheap lands and sparse population, the reaping machine, operated by animal labor, ranks probably next to the plow in its value as an agricultural implement. Though undoubtedly the remote successor of the sickle and the scythe, still the researches which have been made into its history assign it a high antiquity. Pliny, in the first century of the Christian era, describes minutely such a machine as then in use among the Gauls, which being drawn or rather pushed forward by a single ox, was, as we are subsequently informed by Palladius, capable of cutting large fields of grain in a single day. What changes it underwent in the course of after ages, or from what causes it finally fell into disuse, are not certainly known. It was not until towards the close of the last century, that the inventive genius of the world seems to have been again directed to this agricultural implement, and the machine as sketched by Pliny appears to have been the starting point for its reconstruction. From that time until the present day, its progress towards perfection, though slow has been steady and uninterrupted. The improvements of which it has been the subject for the last seventy years have been contributed alike by the ingenious minds of both hemispheres, as shown by the numerous patents which have been granted during that period in Europe and America. It is manifest from the very lucid and elaborate report of the Examiner in this case, that at and before the date of the applicant's invention in 1845, the reaping machine already comprised, in varying combinations, all those fundamental elements which at present enter into its composition. To enumerate, it contained the frame to support the working parts—two wheels for carrying the frame and operating machinery; a platform to receive and carry the grain until raked off by a raker seated on the machine or walking at its side; shafts to draw the machine, arranged at the side of the frame and cutter; the vibrating straight cutter; driving the gearing by the wheels that carry the machine; the spear-head guard-fingers; a crank and pitman for communicating the reciprocating motion to the cutter; reel posts or supports; the arrangement of the outer reel-post behind the cutter and bent forward; the reel; means for adjusting the height of the reel in its supports; an arrangement for regulating the height of the cutter; the lateral arrangement of the platform to and behind the driving wheel, for enabling the raker to remove the grain at the side; the arrangement of the outer wheel for supporting and balancing the machine; the combination of a vibrating serrated cutter with guard-fingers; the blade case; the divider, and the raker's seat. The Examiner, from whose report this enumeration has been extracted, designates the several patented inventions in which these component parts of the reaper appear, and this review of the then actual condition of the machine is essential to correct appreciation of the character and extent of applicant's invention of 1845, now under consideration. The operation of the several parts thus named had proved more or less satisfactory, according to the combinations in which they were found. It seems to have been the purpose of the applicant to improve the efficiency of the functions performed by the divider and reel in separating the grain to be cut from that left standing. This appears not to have been perfectly accomplished before, especially when the grain was lodged or tangled; and if we are to judge from the suggestions of counsel, the special aim of the applicant was to remedy this defect. If so, it

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is very clear from the testimony that he has failed. There are several witnesses, practical farmers, who used the machine as constructed under the patent of 1845 and who declare that in lodged or tangled grain it was wholly inefficient, unless the grain chanced to lean towards it; that the reel was constantly stopping, and that the machine would not cut the grain, but would run over it. This divider, within its own narrow track of twelve inches, certainly lifted and parted the fallen grain, and thus secured the uninterupted progress of the machine; but the same result had been effected—possibly under peculiar circumstances, not quite so well—by other and well-known dividers, among which may be specially named that of the applicant, as appearing in his patent of 1834. For the broad pathway of the cutter, having a width of five or six feet, no provision was made by the invention of 1845 for lodged or tangled grain, beyond the pre-existing imperfect instrumentality of the reel.

The applicant's invention of 1845, as set forth in his reissued patent of 1858, consists of two points:

1st. The curvature of the bearers supporting the cutter apparatus, which, it is insisted will facilitate the discharge of any clogging matter that may enter. It is presumed that this improvement upon the straight bearer formerly in use has a measure of utility; but as it has not attracted the special attention of the witnesses or counsel, it will be dismissed without further comment.

2d. "The employment of the projecting ends of the reel-ribs to affect the separation of the grain to be cut from that to be left standing, in combination with a dividing apparatus, which effects a division of the grain by forming an open space between the outer and inner grain for the ends of the ribs of the reel to act in, in which open space there is no reel-post, or other obstruction, to prevent the free passage of the grain as it is brought back by the ends of the reel-ribs to the platform of the machine, and by which means a separation of the inside grain to be cut from the outside grain to be left standing is made complete by the action and power of the reel."

The "dividing apparatus" referred to consists of a device substantially the same with that previously in use, with this exception, that a crooked iron rod is employed to secure the same divergence on the inner side, which had been previously effected by the inclined edge of the well-known wedge-shaped divider. It probably secured but little, if any, greater divergence than the old device, nor could this have been done without resulting in throwing so much grain between the first pair of fingers of the cutter as to choke it at that point. This feature of the divider was, however, new in form, and presented a further marked trait of novelty in its adjustability, as to height, by means of a slot and screw-bolt. The invention of 1845 consists, then, in a curvature of the bearers and the combination of this precise form of divider just described, with the projecting ends of the reel-ribs, for the purpose of separating the grain. The patentability of this improvement having been recognized by this office and the Supreme Court, it will be treated in this discussion as a settled question.

The inquiry which remains to be prosecuted is, whether the patentee, after the exercise of due diligence, has failed to receive a reasonable remuneration for the time, ingenuity, and expense bestowed upon this invention and upon its introduction into public use. In order satisfactorily to answer this inquiry, it must be ascertained—

1st. What are the profits which the patentee has realized from the sale and use of the invention? and

2d. What is the actual value of that invention, considered as well in reference to its intrinsic character as to the benefits which it has conferred upon the public?

The applicant, in addition to this invention, made a further improvement upon the reaping machine which was patented in 1847, and which consisted in combining a raker's seat with the machine as constructed under the patent of 1845. Having in all the machines and licenses sold by him united the privileges and devices of the two patents of 1845 and 1847, without any designation of their respective values, he has in his account filed, presented the aggregate receipts and expenditures accruing from them both, and has there assigned a moiety of the profits to each of the patents. The gross receipts thus presented amount to $2,868,780. From this, however, must be deducted the $9,354 05 received from Seymour & Morgan, which being proceeds of a judgment against them for infringing the patent of 1845, cannot be properly divided with that of 1847. The proof shows that this exhibit of receipts is not free from errors, but the inaccuracies disclosed are not of a magnitude to justify any special notice.

The gross expenditures are set down at $2,732,035 73, which being deducted from the alleged receipts, yields a profit of $136,-744 27 for the two patents, or $68,372 13 for each of them. A critical examination, however, of the details of this account, as seen especially in the light of the testimony, has led my mind to a very different conclusion as to the amount of profits with which the patent of 1845 should be credited. The items of expenditure will be noticed in he order in which they stand.

The sum of $45,360 is charged as an average interest for fourteen years on the amount debited to the patents of 1845 and 1847, for money expended in experimenting with machines, in traveling, and otherwise prosecuting the invention. This interest was extinguished by the accruing profits, and could not be allowed, unless interest was calculated upon the receipts. As this has not been done, and if done, would exhibit a heavy balance on the other side, this item must be rejected.

There is charged the sum of $93,600 for expenses of litigation, which is stated to have consisted in "three cases that were carried to the Supreme Court, and several others in the circuits." No intimation is given as to the precise purposes for which this large amount was expended. It may have been absorbed by counsel and witness fees, and costs of court, or by something else which the applicant may have regarded as embraced in the comprehensive term "litigation." Neither the names of the parties to the suits, nor the date of their pendency and decision, nor the courts by which they were determined, are given, beyond the general statement that there were several suits in the circuit courts, and three in the Supreme Court of the United States. Certainly nothing could be more indefinite or unsatisfactory. The statute, in requiring the patentee to make a true and faithful exhibit of his receipts and expenditures, clearly intended that his account should assume such a form as would enable the public to investigate it and contest its accuracy, if inclined to do so; such a form too as would place it in the power of the Commissioner to pronounce upon its intrinsic legality, and apply the testimony offered for and against it. Some relaxation of the rigor with which certainty is exacted in all accounts that propose to become the basis of judicial action, has been recognized as proper in behalf of inventors because of their peculiar character. The utmost relaxation, however, of the rule could not sanction a statement so utterly vague as that under consideration. The transactions covered and concealed by its ample folds are without any ear-mark or designation whatever, which could render it possible for the Commissioner or the public to examine them. It may be safely added, that the applicant is not in a condition to claim the benefit of any such relaxation of the general principle referred to, as is insisted on his behalf. He is an inventor, it is true, but, unlike the class to which he belongs, he is also a man of remarkable business habits, who wields millions of capital, is surrounded by his agents and clerks, and keeps the records of his vast transactions with strict commercial accuracy. Had he therefore chosen to open his ledger for our inspection, it would no doubt have exhibited an account of his "expenses for litigation," as complete as that presented by the merchant's books of his daily purchases and sales. With such lights at hand, the applicant's pressing upon our consideration an account so obscure and darkened as this, is wholly without excuse. This item must be disallowed because of its indefinite character, and for the further and all-sufficient reason, that there is no testimony in the case showing, or tending to show, that this amount, or any part of it, was ever expended for the purpose charged.

Next follows an item of $511,750 67 for the transportation of machines and commissions upon their sale. The proof is very full to the effect that the general rule, as announced in the printed circulars of the applicant, was that the cost of transportation should be paid by the purchaser, and this requisition seems to have been rarely departed from. Metcalf, one of applicant's witnesses, thinks that in not more than one case in fifty or sixty, was an exception to the rule allowed; other witnesses say that the freight and charges were invariably collected of the purchaser on the delivery of the machine. There are others who think that this was not insisted on in all cases, as in a certain locality in Illinois, during the year 1855, it is stated that $5 of this expense was paid by the purchaser, and the rest, if anything, by applicant. The few isolated instances in which the cost of transportation was borne by the applicant, not having been pointed out with any reasonable degree of certainty, this portion of the charge must be rejected. Calculating the commissions at ten per cent. on the gross amount of the sales—which is a most liberal allowance—the result will give for this item $283,398 instead of $511,-750 67.

I am wholly at a loss to perceive on what ground the charge of $493,808 52 for "manufacturing profit" can be sustained. The estimate is made at 30 per cent., which is ten per cent. higher than the testimony would warrant, supposing such profit properly chargeable against the patent. The statute in imposing on the patentee the duty of exhibiting a "faithful account of the loss and profit in *any manner* accruing to him from and by reason of his invention," manifestly designed that such loss and profit "should be taken into the estimate in determining the reasonableness of the remuneration received. The patentee may sell his invention or he may use it, either in operating machines made under it on his own account, or in manufacturing such machines and selling them to others. If he pursues the latter course, all profit remaining to him after meeting—what has been so liberally allowed in this case—the interest on the capital invested, and the loss from wear and depreciation of machinery, must be set down not to the debit but to the credit of the patent. Such was the doctrine announced, though not elaborately discussed, by Commissioner Hodges in 1852, on application for the extension of a patent granted to Goodyear, as assignee of Hayward, and it would seem that no other conclusion could be safely drawn from the emphatic and comprehensive words of the statute. This item must, therefore, be stricken from the account.

Of all the details of this extraordinary account, the $359,908 80, set down to the debit of the patent "for loss on debts," is the most remarkable. The books of applicant, as proved by Blakesley, his clerk, who had charge of them, show that on $2,758,900 43 of sales, the "worthless notes and accounts" amounted to but $23,-553 67; and yet, on an outstanding indebtedness, being in part of said sales, of $898,-772 31, it is now proposed to deduct for bad debts $359,908 80, being at the rate of 40 per cent. The testimony not only does not warrant such a deduction, but justifies me fully in saying that five per cent. would be a very liberal allowance for loss on this account. The extravagant estimate under discussion appears to have been based upon the assumption that the value of these debts is to be ascertained by what they would command, if forced upon the market, under the auctioneer's hammer, in a moment of financial revulsion and depression. It can scarcely be necessary to comment upon such an assumption as this. In the judgment of the law, these debts are worth what they will yield after the patient and faithful endeavor to collect them, which experience proves, men ordinarily careful of their interests, will make. Calculating the loss at 5 per cent., we have for this item $44,938 60, instead of $359,908 80.

The account re-stated, with the corrections named, will stand as follows:

Receipts.		
From sales of reaping machines, including 500 machines on hand		$2,833,980 00
From licenses to Wood & Ball		16,000 00
Receipts from patents of 1845 and 1847, before the expiration of the patent of 1834		15,000 00
Receipts from Seymour & Morgan in 1848		4,000 00
		$2,868,980 00
Expenses.		
Expenses of traveling, experimenting, &c, chargeable to the two patents of 1845 and 1847	$36,000 00	
Cost of making machines	1,134,277 74	
Commissions on sales	283,398 00	
Loss on debts	44,938 60	
Interest on capital	40,950 00	
Depreciation of machinery,	31,500 00	
		1,571,064 34
Credit to patents of 1845 and 1847		$1,297,915 66

That this is rather below than above the amount of profits actually realized from the two patents, may be fairly inferred from the testimony. In 1845 the applicant, as proved by his brother, was worth nothing; or to use his own phrase, "was not worth a red cent." One of his agents, who appears to be thoroughly acquainted with his business and estates, states that he is now worth about a million and a half of dollars. No attempt has been made to controvert either of these statements; nor is there any allegation that since 1845 the applicant has been engaged in any other enterprise or pursuit, or has had any other resources than the sale and use of his inventions as patented in 1845 and 1847. This colossal fortune is, then, clearly and wholly their fruit. In the total absence of any testimony tending to show the relative expenses and profits of the inventions of 1845 and 1847, I am constrained to accept the estimate of the applicant, which assigns an equal share of the profits to each. This will give to the patent of 1845 a profit of $648,957 08, to which must be added $9,354 05, being proceeds of the judgment against Seymour & Morgan—thus presenting an aggregate of $658,311 13.

Is this a reasonable remuneration?

[CONCLUDED NEXT WEEK.]

Correspondents

*** Persons who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

Numbers 4, 14, 17, and 19, this volume of the Scientific American, cannot be supplied, as we are entirely out of them.

M. W. O., of Iowa —Citizen patentees are not compelled to have their articles in market within a specified time. Foreign patentees, however, must put their articles on sale within eighteen months from the date of patent. You could trust your invention with any honorable person.

J. D., of La.—Enameled oilcloth which greatly resembles morocco leather, is made of twilled cotton covered with several coats of oil-varnish. The first coat is generally composed of boiled linseed oil oxydized with some sulphuric acid and sulphate of zinc, and is rendered jet with lamp-black. All the subsequent coats are similar, only the first is the thickest. After each coat the cloth is dried in an oven, and it is polished with pumice stone before it receives its last varnish. The leather appearance is given to it by pressure between rollers. Such cloth is now used very extensively for upholstering articles, such as cushion covers, &c. It is nearly as durable as leather, and is far superior to it for traveling bags, as it is not affected by rain.

E. A. B., of N. H.—Any kind of varnish colored with dragon's blood will answer for violins. Add a little red sanders, and it will become richer in the tint.

A. Y. McD., of Mo.—The steam domes of all the boilers in a gang should be connected together by pipes, and so should the feed water pipes. You have been anticipated in similar views to those contained in your letter by one published on page 186 of the present volume of the Sci. Am.

G. Z., of Pa.—What use do you make of boxes with spiral grooves, as represented in your sketch? There can be no good draft in a chimney unless it is hot. If the top of a chimney were colder than the surrounding atmosphere, it would cause a downward instead of an upward draft.

L. P., of Mass.—We are out of the numbers you send for. You had better advertise your patent felt roofing in our paper, then you will reach the enquiry referred to.

L. B., of Wis.—Quicksilver is made into an amalgam with tin for putting on the backs of looking-glasses There is but little difference between the durability of all the kinds of tin roofs, if they are put on well in the first place. We prefer the soldered, but others prefer the lapped roof.

R. W. Sanders, of Tuscaloosa, Ala., wishes to engage a person who understands the brewing of lager bier.

F. L L., of N. Y.—We did not secure the patent to which you refer.

W. W., of Ohio.—You need have no serious apprehension about McCormick's extension case. He cannot prevail on Congress to grant it. We shall oppose it, of course, as we do all such cases. We have not a single copy of the number you want.

E. R., of C. W.—You can purchase the work you mention from Wiley & Halsted, of this city. We think Smee's battery is the best for silver-plating.

C. M., of Conn.—Common pitch applied hot is an excellent cement for an aquarium. White lead and ground glass make a good cement.

W. E., of Ohio.—We do not believe that it makes a particle of difference in the health of a person whether he sleeps with his head east, west, north or south. A child will neither be injured mentally or physically by sleeping with a "healthy" old person.

S. S. B., of Ala.—A patent on a stitch is for a particular way of interweaving threads, and is not for a general "result." We have not stated that the claim to the stitch you allude to was "undoubted." Any person using a patented stitch would infringe; but the machine by which it was made would not necessarily be an infringement. As to whether the assignee, assignor, or manufacturer would have to buy the right to use the previous patent, depends upon their mutual agreement. In the absence of any agreement, the manufacturer only would be accountable to the holder of the prior patent.

G. H. & H. S., of Iowa—We should rejoice as heartily as yourselves, depend upon it, if your wish "that the Scientific American might have 200,000 subscribers" could be realized. We are ready and anxious to receive them. You can have the money you speak of paid over to us, if you wish so to do.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, February 12:—

A. O., of N. Y., $5; D. F., of Pa., $35; J. D. M., of Ohio, $55; W. L. W., of N. Y., $60; C. D. W., of Ohio, $25; J. S., of N. J., $15; R. T. W., of N. Y., $30; W. F. M., of N. Y., $25; A. W., of N. Y., $30; S. D., of Mich., $32; R. B., of Conn., $30; R. S. L., of Conn., $30; M. G., of Conn., $25; F. & C., of Mass., $30; C. Van T., of N. Y., $100; J. C., of N. J., $30; T. L. W., of La., $300; J. F., of La., $25; J. L., of La., $30; A. B. & G., of Pa., $250; J. G., of Ky., $20; J. R., of Pa., $35; M. C., of N. Y., $25; S. W. & R. M. D., of Mass., $15; E. S., of Vt., $25; S. & C., of R. I., $30; H. H. & W., of N. Y., $30; D. L., of Mo., $30; R. S. L., of Conn., $30; M. B., of N. Y., $30; W. G. R., of Mass., $55; J. C. S., of Mass., $5; T. H. W., of ——, $30; T. W. G., of N. J., $15; E. P. T., of N. J., $30; K. & B., of L. I., $10; H. W. F., of N. J., $30; L. S. W., of Conn., $30; C. & D., of Ill., $25; J. S. W., of Iowa, $30; E. W., of R. I., $30; A. & H., of N. Y., $30; A. S. S., of Mass., $30; W. S., of Mo., $30; G. W. L., of Ind., $25; D. B., of N. Y., $30; W. W. S.,

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of Ohio, $100; L. & G., of Ohio, $30, J. P., of Cal., $30; M. H., of Conn., $55; W. Z. C., of Ill., $55; T. J. DeY., of Pa., $25; A. L., of N. Y., $100; W. & F., of N. Y., $20; C. M., of N. J., $40; E. G. & Sons, of Mass., $55; E. H., Jr., of N. Y., $55; J. G. W., of N. Y., $55; G. B., of N. Y., $25; C. D. B., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, February 12:—

J. L. R., of N. Y.; M. G., of Conn., R. S. L., of Conn.; W. S. K., of Conn.: C. D. W., of Ohio; A. C., of N. Y.; O. H. M., of Iowa; W. F. M., of N. Y.; E. S., of Vt.; M. C., of N. Y.; J. R., of Pa.; H. F., of La.; J. G., of Ky.; J. S., of N. Y.; C. & D., of Ill.; G. S., of N. Y.; C. M., of N. J.; E. L. R., of N. Y.; W. W. S., of N. Y.; W. & R., of Vt.; C. M., of Wis.; G. W. L., of Ind.; T. J. DeY., of Pa.; H. W. H., of Conn.: W. & F., of N. Y.; G. S., of N. Y.; E. G., Jr., of Mass.; E. H., Jr., of N. Y.; J. G. W., of N. Y.; C. D. B., of N. Y.; G. B., of N. J.; J. G. W., of N. Y.

Literary Notices.

CURIOSITIES OF NATURAL HISTORY. By F. T. Buckland, M. A. New York: Rudd & Carleton, 310 Broadway.—This is truly a pleasant book, redolent of the life of woods and fields and running brooks, and while it teaches, it amuses. Stories of animals and fish are told that are quite new, and reptiles have a place. The author is an army surgeon, and the son of the late Dr. Buckland, the geologist, so he has an inborn taste and a large opportunity for observation, which he has made good use of. The book is so truly charming, that we took it up just to look into it, and have concluded by reading every page with more interest than any work of fiction we ever perused. Would that we had more like it, for it is the most pleasant science we ever studied.

BLIND BARTIMEUS: Or, The Story of the Sightless Sinner and his Great Physician. By Rev. William J. Hoge, Professor, Union Theological Seminary, Virginia. New York: Sheldon, Blakeman & Co., publishers, Nassau street.—This is an eloquent and instructive religious volume, and well calculated to encourage and comfort all who are disposed to seek for it above the merely sensual.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office. 37 Park Row, New York. We established, over a year ago, a Branch Office in the City of Washington, on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

—

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

Communications and remittances should be addressed to MUNN & COMPANY,
No. 37 Park-row, New York.

TO PUMP-MAKERS—THE UNDERSIGNED, having purchased of Hosea Lindsey his entire interest in a horizontal Force Pump invented and patented by him, is desirous of selling State or county rights on reasonable terms, to persons desiring to engage in the sale of a useful and saleable article. Apply by letter or otherwise to WM. W. McDOWELL, Asheville, N. C. 24 2*

MICROSCOPES AND MICROSCOPIC OBJECTS, Surveyors' Compasses, Spyglasses, Stereoscopes, Barometers, Mathematical Instruments, Magic Lanterns, Globes, Thermometers, Spectacles in Gold, Silver, and Elastic Steel Frames. Reading Glasses, Magnifiers, Electrical Machines, Galvanic Batteries, Magnets, &c.
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HUNTINGTON MACHINE CO., Nos. 121 AND 123 Halsey st., Newark, N. J., manufacture a large variety of wood-working machinery, consisting in part of Woodworth and Gray's Wood-planing Machines, Molding and Sash-sticking Machines, Tenoning Machines, Wright's Patent Scroll Saws, Slotting and Cut-off saws, Blanchard's and Landphin's Spoke and Handle Lathes, Huntington's patent Re-sawing Mill, Steam Engines, Shafting, Pullies, &c., to order. 1*

SCREW BOLTS—WITH SQUARE, ROUND, or Countersunk Heads, Bolt-ends, Turn Buckles, Square-head Wood Screws, Tap Bolts, Machine Screws, Ratchet and Breast Drills, Carriage Bolts, Nuts, Washers, &c., for sale by CHARLES MERRILL & SONS, No. 556 Grand st., New York. 24 5*

B. T. BABBITT'S SAPONIFIER, OR CONcentrated Lye, manufactured at Nos. 68 and 70 Washington st., New York. Warranted to make soap without lime, and with little or no trouble.

CROSSETT'S PATENT STAVE CUTTER—Patented July 1, 1844; re-issued March 2, 1858; renewed and extended June 26, 1858. The above-mentioned machine is warranted to cut more and better staves than any other machine in the United States, and is the most simple, cheap, and durable. I hereby caution all persons against using and vending said machine (the main features of which consist in the stationary knife and vibratory bed-piece) without the legal right to do so. Offenders will be dealt with according to law. All persons wishing an interest in the extended term of said patent can obtain it by addressing the undersigned at Joliet, Ill.
21 7* GEO. I. CROSSETT, Assignee.

CLAY RETORTS—THOS. HOADLEY, PATentee of the Patent Pyro-clay Gas Retorts—manufactory Nos. 32 and 34 Front st., Cleveland, O. 24 12*

SOMETHING NEW—B. T. BABBITT'S BEST Medicinal Saleratus is manufactured from common salt. B. T. Babbitt's best Saleratus is prepared entirely different from other saleratus. All the deleterious matter is extracted in such a manner as to produce bread, biscuit, and all kinds of cake without containing a particle of saleratus when the bread or cake is baked, thereby producing wholesome results. Every particle of saleratus is turned to gas, and passes through the bread or biscuit while baking, consequently nothing remains but common salt, water and flour. You will readily perceive, by the taste of this saleratus, that it is entirely different from other saleratus. When you purchase one paper, you should take the old paper with you, and be very particular and get the next exactly like the first—name and picture, twisted loaf bread, with a glass of effervescing water on the top, as you see in the bill. Full directions for making bread with sour milk and cream tartar, and all kinds of pastry; also for making soda water; also directions for making seidlitz powders, will accompany each package.
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Nos. 68 and 70 Washington st., New York,
1 and No. 38 India st., Boston.

BLANCHARD'S SPOKE AND HANDLE LATHE—This justly celebrated lathe for turning spokes, gun stocks, axe handles, and other irregular forms, is manufactured by the HUNTINGTON MACHINE CO., Newark, N. J. 24 2*

RUSSELL & DAVISON HAVE ON SALE their new patent Spiral Oven, for baking family and ship bread; also iron gas and steam pipes, steam gages, thermometers, salenometer thermometers, &c., &c. Plans and specifications for the construction of gas-works and other machinery furnished, and the work carefully superintended. A working model of the Spiral Oven can be seen at the office, 26½ Broadway, New York. 24 1*

PURE CONCENTRATED POTASH, IN SIX-Pound Cans—Six pounds of this Potash are equal to twelve pounds of common potash. This article is broken into small pieces, suitable for retailing in the smallest quantities. The attention of druggists especially is called to this potash. Cases of 1 doz., 2 doz., 3 doz., and 6 doz. For sale by
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CROZIER'S PATENT BARREL MACHINERY—Five hundred barrels can be made in a day by one set of machines. For machines or rights for State or county, apply to the agents, SLIPPER & GOADBY, No. 2 Broadway, New York. 24 4*

PATENT RIGHT FOR SALE—CHAPMAN'S improved Turn Buckle, to hold window-shutters from rattling. Patented December 28, 1858. For further information, address the patentees, GEORGE & JAMES CHAPMAN, Philadelphia, Pa. 1*

THE WILLCOX & GIBBS' REVOLVING Looper Sewing Machine (illustrated in SCI. AM., Vol. 14, No. 21), is manufactured and for sale by JAS. WILLCOX, No. 715 Chestnut st., Philadelphia. This machine more fully meets the requirements of families than any heretofore produced, being at once simple, the workmanship perfect, and hence reliable. Competent agents are wanted. 21 4*

SECOND-HAND MACHINERY AT VERY low prices for cash.—Steam Engines, Slide Lathes, Planing Machines, Drills, Slotting Machines, &c.; also a variety of Mortising, Tenoning, and Sash Machines, &c., all warranted in good running order. Address CHARLES G. WILLCOX, 135 North Third st., Philadelphia, Pa. 23 4*

DRAINING TILE MACHINES OF THE most approved construction, manufactured by R. R. GIFFORD, Albany, N. Y. 23 12*

WANTED—A SECOND-HAND OR NEW UPright Boring Machine, to take in about nine feet. Address, with terms, T. D. STETSON, Consulting Engineer, No. 5 Tryon Row, New York. 23 3*

WOODWORTH PLANING MACHINES—Sash, Tenoning and Mortising Machines, Steam Engines, Slide Lathes, Drills, &c., at greatly reduced prices. Address CHARLES H. SMITH, 135 North Third st., Philadelphia. 23 4*

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Photographers and Engravers,
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CALIFORNIA AGENCY FOR PATENTS—WETHERED & TIFFANY, San Francisco, will attend to the sale of patent rights for the Pacific coast. References:—Messrs. Tiffany & Co., New York; Wethered, Brothers, Baltimore; George W. Ponds & Co., Boston. 23 13*

STEAM ENGINES, SLIDE LATHES, Planing Machines, Drills, &c.—Orders taken for all descriptions of machines for working in wood or iron. Address CHARLES H. SMITH, Machinery Depot, No. 135 North Third st., Philadelphia. 23 4*

HOLLY'S PATENT ROTARY PUMP and Rotary Engine has no valves or packing, and is the most simple, durable, and effective Force Pump in use, as numerous certificates in our possession will prove. Also manufacturers of the celebrated Rotary Steam Fire Engines, with which we challenge the world, as to portability, time of getting at work, low pressure of steam used, quantity of water discharged, and distance forced. There are now four of these machines in use in the city of Chicago, and one in the city of Boston, Mass. Third class engine weighs about 7,000 pounds, and forces a 1¼-inch stream 200 feet, or two 1-inch streams 180 feet, or one 1¼-inch stream 240 feet, with a steam pressure of from 40 to 60 pounds. Generates a working pressure of steam in from 4 to 6 minutes from cold water. Descriptive catalogues of pumps, engines, &c., sent to all applicants.
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GROVER & BAKER'S CELEBRATED Family Sewing Machines—495 Broadway, New York; 18 Summer st., Boston; 730 Chestnut st., Philadelphia; 137 Baltimore st., Baltimore; 58 West Fourth st., Cincinnati. A new style—price $50. This machine sews from two spools, as purchased from the store, requiring no re-winding of thread. It hems, fells, gathers and stitches in a superior style, finishing each seam by its own operation, without recourse to the hand-needle, as is required by other machines. It will do better and cheaper sewing than a seamstress can, even if she works for one cent an hour. ☞ Send for a circular. 19 13

WROUGHT IRON PIPE FROM ⅛ OF AN inch to six inches bore; Galvanized Iron Pipe (a substitute for lead), Steam Whistles, Stop Valves and Cocks, and a great variety of fittings and fixtures for steam, gas, and water, sold at wholesale and retail. Store and Manufactory 76 John, and 29, 31 and 33 Platt st., New York. JAMES O. MORSE & CO. 18 13

WATER WHEELS—BALDWIN'S "UNIVERSAL TURBINE" gives better satisfaction than any other water wheel, the overshot not excepted. It gives a higher percentage, with a partially raised gate, than any other. It gives from 75 to 97 per cent, according to the size of wheel and head applied. When you purchase a water wheel, my friends, get the best, if you would save money, as the best is always cheapest in the end, and you will have to make no changes. For further information address, S. K. BALDWIN,
Laconia, N. H.
"We have examined a model and drawings of the 'Universal Turbine,' and believe it to be a scientific water wheel, and one calculated to give the greatest amount of power from a limited quantity of water."
—Munn & Co. 18 13*

COTTON-OPENERS AND CLEANERS—Kitson's latest improved Cotton-openers, which were introduced September, 1857, have been adopted by the following companies, of Lowell, Mass.: Suffolk, Lawrence, Tremont, Appleton, and Prescott Corporations; and the Pacific Co., Lawrence, Mass.; Cocheco Co., Dover, N. H.; Salmon Falls Co., Salmon Falls, N. H.; Ogden Mills, Cohoes, N. Y., and other places. For price and other particulars enquire of RICHARD KITSON, Lowell, Mass. 21 5*

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Science and Art.

Beams and Girders.

MESSRS. EDITORS—I have just read the conclusion of Mr. D. H. Morrison's papers on beams, &c., as published in the SCIENTIFIC AMERICAN. I am pleased with the kindly manner in which he has alluded to what I have said on the same subject; and I trust I shall not be thought wanting in courtesy in coming direct to the question, and confining my remarks strictly to it.

First, let me furnish a very simple rule for estimating the strains in beams and similar structures—one that is known to be true. When the load is uniformly distributed, then suppose one-half of it to be placed on the middle of the beam, multiply this half load by one-quarter of the span, and divide the product by the depth of the beam, and the quotient will give the horizontal strain in the upper and lower parts of the beam. When the load is concentrated on the middle, then proceed with it as with the half of a uniform load.

Now apply this rule to Mr. Morrison's theory, and it will be found that he has made an error of just one-half in the first part, in assuming that the intensity of the horizontal strains are represented by the lengths of the horizontal lines, $g\,a$ and $a\,i$; and it will also be found that he has committed a similar error in the last part. The horizontal thrust or strain is five tuns where he makes it ten. Now, as all his calculations as to the forms of beams and curves of equilibrium seem to rest on this assumption, his conclusions cannot be reliable.

In answer to his suggestion that the curve of equilibrium may be elliptical, because this form is supposed to be best for the upper side of a beam of uniform breadth, I will only say that such form was meant for such beams only. And I will add that the forms he suggests for rectangular beams are not practical, at least, not for solid ones, for they cannot be rolled; and if they should be cast in such forms, they would be greatly strained, if they did not break, in cooling.

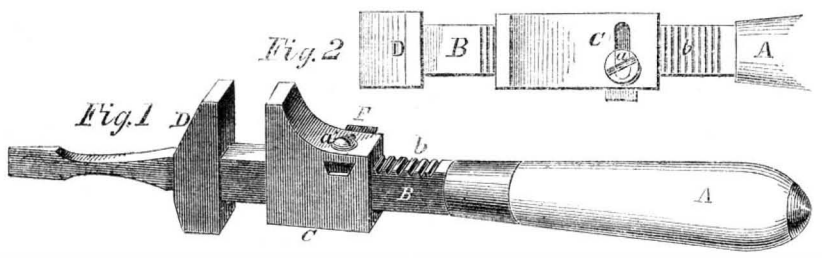
To show that there is no neutral point in the center of a beam, any more than a neutral axis, let us suppose this point to be one inch, two inches, or three inches in diameter, and make a hole of this size through the center of the beam. Now it is quite clear that there can then be no strain within this opening, whether it be large or small, for there is no material within it to be strained; and this would be equally true of a similar opening in any other part of the beam. But retain the material of the hole in its place, and remove all the material above and below this part, then the strain will be wholly concentrated in this part or point, and will increase in intensity as the size of this part is reduced. This may be carried to an infinite extent, so that when this point has no magnitude, the beam will have no strength. Hence the theory of a neutral point is of no more practical importance than that of a neutral axis. We may, it is true, find a point or line that is midway between the positive and negative forces in beams; but it will depend altogether on the form and construction of the beam whether these points or lines will be strained or not. But to seek for such points first, and then base all our calculations as to strains on the distance these points may be from the centers of the opposing forces, seems to be about as sensible as it would be to seek first for a similar central point between a fulcrum and weight, or power, to determine the power or capacity of a simple lever. Indeed, a beam may very properly be considered a lever, regarding the vertical pressure on the bearings under its ends as the power acting upward, and considering the depth of the beam as the distance between the fulcrum and the weight or resistance, and half the length of the beam as the distance between the fulcrum and the power, that is, when the load is concentrated on the middle; but when the load is uniformly diffused over the beam, then the distance from the end to the center of gravity, or one-quarter of the span, will be considered as the distance between the fulcrum and the power. This rule agrees with the first, and both agree with the results of actual trials. The power may always be known to be exactly equal to one-half of the whole load, and one-half of the weight of the beam. BENJ. SEVERSON.

N. B.—I also refer to "Haupt on Bridge Construction" (page 115), regarding strains in the chords. B. S.

Baltimore, February, 1859.

[Much attention has been attracted to, and a great deal of interesting information published on, this subject; but we are unable to devote any more space at present to its consideration.—EDS.

McKENZIE'S WRENCH AND SCREW-DRIVER.



When a workman is called out to do some work, the fewer tools that he has occasion to carry the better, and for such emergencies combination tools are very convenient, and they are also, as Mrs. Toodles remarked, "handy things to have about a house." The special tool to which we wish to call attention is a combined screw-driver and wrench—light, convenient, and acting with the sureness of two separate tools. It is fully shown in our illustrations, Fig. 1 being a perspective view, and Fig. 2 a front elevation of the implement.

A is the handle, which is made in the usual manner, and from it projects an iron bar, B, provided with a number of serrations, *b*, on its upper surface, B, at its end, is worked into a hammer head and wrench-jaw, D. There is a socket in the head, D, in which the screw-driver or any other tool can be fitted. The sliding jaw, C, is secured in any position on B to accommodate itself to any sized nut by a serrated wedge-shaped piece or button, F, that by a screw, *a*, works in a slot in C, and pressing down upon B the serrations or ridges on the under surface of F press into the depressions of *b*, and so hold the wrench fast on the nut which is to be turned.

This simple device is the invention of John McKenzie, of Troy, N. Y., who will be happy to furnish any further information that may be desired. It was patented May 11, 1858.

Important India-Rubber Decision.

On Friday morning last, in the United States Circuit Court, an important opinion was delivered by Judge Ingersoll in the cases of Horace H. Day *vs.* Carey, Howard & Sawyer, and others, against whom he had sued for injunctions to restrain them from making, using or selling elastic woven india-rubber goods. The Court denied the motions, and decided, among other things, that Day, himself, had no right whatever to make, use, sell, or apply Goodyear's invention of vulcanized rubber for the manufacture of elastic woven goods, or other elastic goods, or to grant licenses for the same, except "shirred or corrugated goods," made according to the patent issued to Charles Goodyear, dated March 9, 1844, as granted to said Day by agreements of October 29, Nov. 5, and Dec. 5, 1846. The exclusive right to all elastic goods, except such shirred goods, is vested, as we are informed, in William Judson, Esq., the attorney and counsel of Chas. Goodyear, except as relates to suspenders, the exclusive right to which is vested in the Nashawannuck Company, Mass.

In order that our readers may understand the nature of the invention in controversy, we present the following information in regard to it:—

These goods are formed by cutting sheet india-rubber into very narrow strips, or threads, say of one-eighth or one-sixteenth of an inch in width, and usually of the thickness of a card. These strips are then stretched upon a suitable board or table, in such a manner as that they may pass back and forth parallel to each other, say at the distance apart of one-fourth of an inch, more or less. The table or board is provided with pins, or notches, at each end, and round these pins, or through the notches, the threads are to be stretched as they pass back and forth; the stretching of these strips may amount to twice their quiescent length. Whilst so stretched, two lamina of cloth or other suitable material, of the requisite width and length, which are covered on one side with moist india-rubber cement, are to be placed one on each side of the stretched threads, the cemented sides being towards said threads; these lamina are to be brought into contact with each other between the threads, which may be readily done by passing a smooth piece of metal, ivory, or other article along the side of each of the threads.

The claim is to the forming of such goods by the stretching of strips, or threads, of india-rubber to such extent as may be desired, and the covering the said strips or threads on opposite sides with lamina of cloth, leather, or other suitable material, which lamina are to be united to each other, and to the threads, or strips, by means of india-rubber cement, the same being effected so as to produce a manufactured article substantially as described.

Heating Railroad Cars.

MESSRS. EDITORS—The common method of heating railroad cars with stoves is very defective, and is an annoyance to every traveler. The heat from a stove is mostly concentrated in a very small space, and is not diffused equally, as is required in long cars. I believe that steam might be conveniently employed as a far superior heating agent in the trains of every railroad in our country. The waste steam escaping through the smoke stack of the locomotive could be made use of economically for this purpose. The plan I propose is as follows:—Secure a flaring pipe at the end of each car, as the main conductor, and from this let several branch pipes of smaller size run through the car inside. The several cars of a train may have their steam pipes connected by flexible india-rubber joints, easily attached and detached, and the whole of these connected with the boiler of the locomotive.

Such an arrangement would heat railroad cars in a very safe, superior, and economical manner to that of stoves. As each car has its own independent connection, any one can be taken off at a station if not required, or more cars may be added to a train without the least difficulty. H. O. H.

New York, February, 1859.

[The heating of railroad cars by steam from the locomotive boiler has been proposed to us several times, and it is admitted that this would be the most convenient method of heating cars, but no really practical arrangement for this purpose has yet been applied. If railroad cars were to be heated by steam, the capacity of the locomotive boiler would require to be greatly increased, because it would take a very great amount of steam for this purpose. The exhaust steam could not be well applied, as it is required to produce the draft. Another point to be looked at in this connection, is the inability to heat the cars before they start on a trip.

It has also been proposed to heat cars with hot air, by pipes running through the fire-box of the locomotive, and extending by flexible connections through all the cars. Such an arrangement was illustrated in Vol. II, SCIENTIFIC AMERICAN; but it never was applied, so far as we know, on any railroad. It appears to be as good a system as heating cars with steam; but we think it will be very difficult to get either of these methods introduced. Some improvement over the present mode of heating cars is demanded, and the foregoing deserves the attention of all who take an interest in the welfare of the traveling community; and who does not, in this great *wide-awake* republic?

ECONOMICAL LOCOMOTIVES.—The locomotives of a new railroad line in Scotland are constructed to consume only seven pounds of coke per mile, or about one-fifth of the consumption of locomotives annually.

ACKNOWLEDGEMENT.—We have to thank the Hon. John Cochrane, Member of Congress for this city, for a generous supply of garden seeds, pamphlets, &c., of interest in a newspaper office.

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